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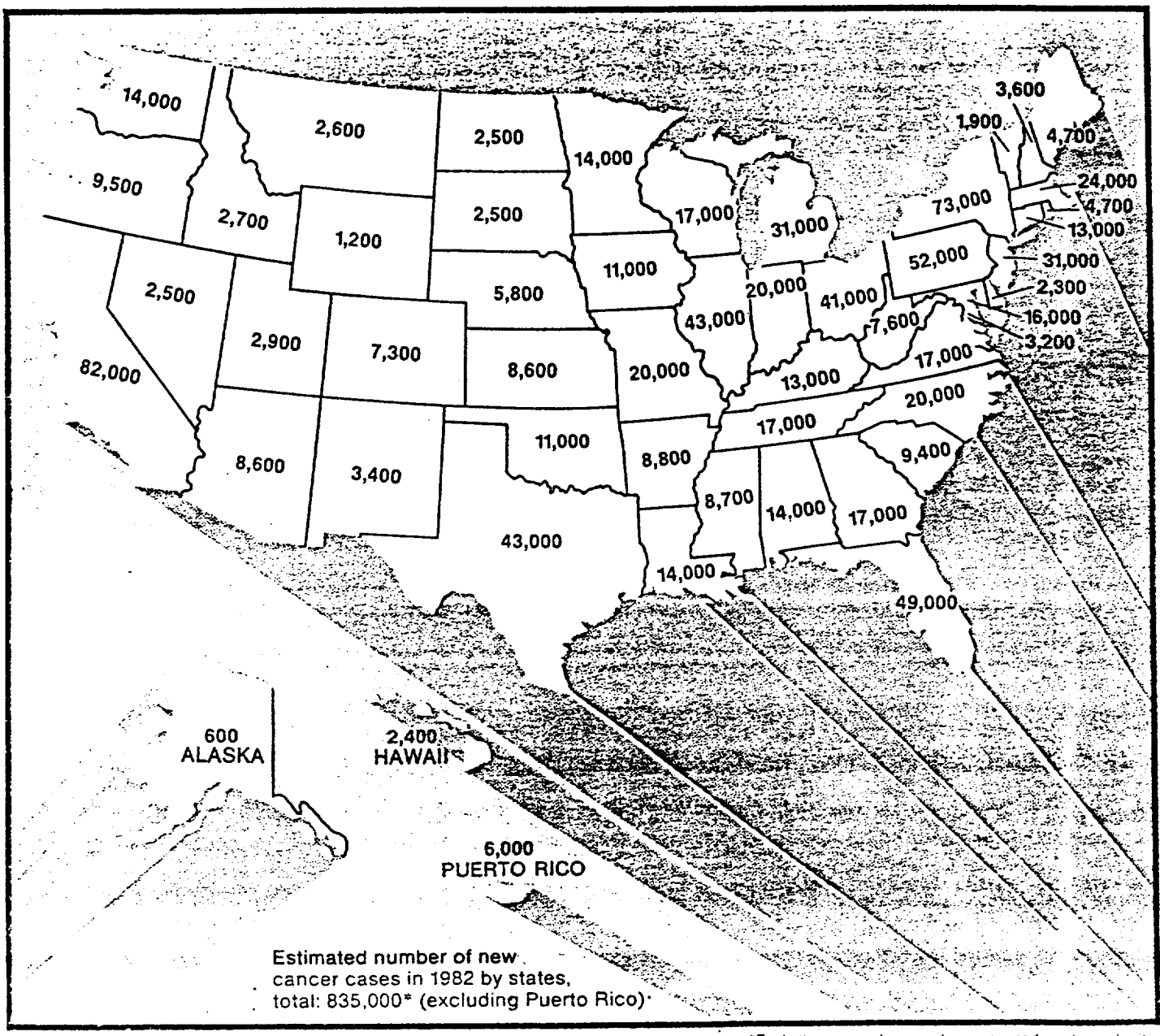
American Cancer Society

1982 CANCER FACTS & FIGURES



Estimated number of new cancer cases in 1982 by states, total: 835,000* (excluding Puerto Rico)

*Excluding non-melanoma skin cancer and carcinoma in situ
BASED ON RATES FROM NCI SEER PROGRAM (1973-1976)

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CANCER'S 7 WARNING SIGNALS

Change in bowel or bladder habits

A sore that does not heal

Unusual bleeding or discharge

Thickening or lump in breast or elsewhere

Indigestion or difficulty in swallowing

Obvious change in wart or mole

Nagging cough or hoarseness

If YOU have a warning signal, see your doctor!

BASIC DATA

What is cancer?

Cancer is a large group of diseases characterized by uncontrolled growth and spread of abnormal cells. If the spread is not controlled or checked, it results in death. However, many cancers can be cured if detected and treated promptly.

How is cancer treated?

By surgery, X rays, radioactive substances, chemicals, hormones and immunotherapy.

Has there been any progress against cancer?

Yes. In the early 1900's few cancer patients had any hope of long-term survival. In the 1930's less than one in five was alive at least five years after treatment. In the 1940's it was one in four. Now the ratio is one in three. The gain from one in four to one in three currently represents about 70,000 people this year.

Who gets cancer?

Cancer strikes at any age. It kills more children 3 to 14 than any other disease. And cancer strikes more frequently with advancing age.

How many people alive today will ever get cancer?

About 58 million Americans now living will eventually have cancer; one in four, according to present rates. Over the years, cancer will strike in approximately two of three families. In the 70's, there were an estimated 3.5 million cancer deaths, over 6.5 million new cancer cases, and more than 10 million people under medical care for cancer.

How many people alive today have ever had cancer?

There are over 3 million Americans alive today who have a history of cancer, 2 million of them with diagnosis five or more years ago. Most of these 2 million can be considered cured, while others still have evidence of cancer. By "cured" is meant that a patient remains free of disease and has the same life expectancy as a person who never had cancer.

The decision as to when a patient may be considered cured is one that must be made by the physician after examining the individual patient. For most forms of cancer, five years without symptoms following treatment is the accepted time. However, some patients can be considered cured after one year, others after three years, whereas some have to be followed much longer than five years.

How many new cases will there be this year?

In 1982 about 835,000 people will be diagnosed as having cancer.*

How many people are surviving cancer?

About 278,000 Americans, or about one-third of all people who get cancer this year, will be alive at least five years after treatment. However, when normal life expectancy is taken into consideration (factors such as dying of heart disease, accidents and diseases of old age), 41% of cancer patients will survive at least five years.

Could more people be saved?

Yes. About 139,000 people with cancer will probably die in 1982 who might have been saved by earlier diagnosis and prompt treatment.

How many people will die?

This year, about 430,000 will die of the disease — 1,180 people a day, one every 73 seconds. Of every five deaths from all causes in the United States, one is from cancer. In 1981, an estimated 421,000 Americans died of cancer, 413,000 in 1980 and 405,000 in 1979.

What is the national death rate?

There has been a steady rise in the age-adjusted** national death rate. In 1930 the number of cancer deaths per 100,000 population was 143. In 1940 it was 152. By 1950 it had risen to 158 and in 1977 the number was 175. The following year, however, the rate slipped to 168. Except for cancer of the lung, age-adjusted cancer death rates for major sites in general are leveling off and in some cases declining.

Can cancer be prevented?

Some cancers, not all. Most lung cancers are caused by cigarette smoking, and most skin cancers by frequent overexposure to direct sunlight. These cancers can be prevented by avoiding their causes. Certain cancers caused by occupational/environmental factors can be prevented by eliminating or reducing contact with carcinogenic agents. Examples include bladder cancer among workers in the dye industry and lung cancer in asbestos workers — especially those who are also smokers.

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*These estimates of the incidence of cancer are based upon data from the National Cancer Institute's SEER Program (1973-1978). Non-melanoma skin cancer and carcinoma in situ have not been included in the statistics. The incidence of non-melanoma skin cancer is estimated to be about 400,000.

**Age-adjusted — a method used to make valid statistical comparisons by assuming the same age distribution among different groups being compared.

SOURCES OF INCIDENCE AND MORTALITY STATISTICS

INCIDENCE

Cancer in most parts of the United States is not a reportable disease. Thus there is no way of knowing exactly how many new cases of cancer are diagnosed each year. In the past, estimates of cancer incidence were made by extrapolating from the experience of the few population-based cancer registries.

In 1969, the National Cancer Institute embarked on a three-year survey of cancer incidence in nine major areas of the United States. It was the most comprehensive incidence survey ever carried out. Then in 1973, NCI began a new and larger program, gathering data from 11 population-based registries. It is called SEER, standing for Surveillance, Epidemiology and End Results.

Beginning with the 1979 edition of *Facts & Figures*, SEER incidence information has been used. The latest available information for this 1982 edition is from the years 1973-1978. Each time a new data base is introduced to estimate incidence, there may be sharp changes in figures due to the more accurate data. They do not indicate a cancer epidemic or new cure.

Since comparisons of figures from different data bases are not valid, one can compare the 1978 *Facts & Figures* only with the previous editions, and the 1979 *Facts & Figures* only with later editions.

MORTALITY

There has been no change in the data base for mortality statistics. The source is the National Center for Health Statistics, Department of Health and Human Services.

The 1982 figures are estimates based on the latest available information, which includes material through 1978.

However to increase accuracy, mortality rates per 100,000 population have been age-adjusted to the 1970 census. For these population-based mortality rates alone, comparing charts and figures with those of previous years may indicate false trends.

HOW CANCER WORKS

Normally, the cells that make up the body reproduce themselves in an orderly manner so that worn-out tissues are replaced, injuries are repaired and growth of the body proceeds.

Occasionally, certain cells undergo an abnormal change and begin a process of uncontrolled growth and spread: one cell divides into two, those redivide into four, and so on. These cells may grow into masses of tissue called tumors – some benign and others malignant (cancer).

The danger of cancer is that it invades and destroys normal tissue. At the beginning, cancer cells usually remain at their original site, and the cancer is said to be *localized*. Later, some cancer cells may invade neighboring organs or tissue by direct extension of growth or they become detached and are carried through the lymph or blood systems to other parts of the body.

This spread may be *regional*—confined to one region of the body—when cells are trapped by lymph nodes. If left untreated, however, the cancer is likely to spread throughout the body. This is advanced cancer, and usually results in death.

Because with each stage a case of cancer becomes progressively more serious, *it is important to detect cancer as early as possible.* Aids to early detection include cancer's Seven Warning Signals and the cancer risk factors. (See under Individual Sites.)

CANCER RATES IN BLACKS AND WHITES*

A study of cancer rates over several decades shows that the cancer incidence rate for blacks is higher than for whites, and that blacks also have a higher death rate than whites.

Male cancer incidence and mortality rates in each race increased while female rates decreased.

The overall cancer incidence rate for blacks went up 8% while for whites it dropped 3%. Cancer mortality has increased in both races but the rate for blacks is greater than for whites. In the last 25 years, cancer death rates in whites have increased 9% while black rates have increased 34%, whereas the rates

*Figures for cancer incidence are from the National Cancer Institute National Surveys, 1947 and 1969; those for cancer mortality from the National Center for Health Statistics, 1953-1978.

were virtually the same 25 years ago.

Cancer sites where blacks had significantly higher increases in incidence and mortality rates included the lung, colon-rectum, prostate and esophagus. Esophageal cancer, long considered mainly a disease of males, declined in whites and rose rapidly in blacks of both sexes.

The incidence of invasive cancer of the uterine cervix dropped in both black and white women, although the incidence in blacks is still more than double that in whites. However, the rate for endometrial cancer – or cancer of the body of the uterus – for white women is double that of black women.

Survival for patients diagnosed between 1967 and 1973 was compared. More whites than blacks had cancer diagnosed in an early, localized stage when the chances of cure are best: 37 versus 28% for males, and 42 versus 31% for women.

A recent ACS-sponsored survey by the black-owned New York firm of Evaxx, Inc. showed that urban black Americans tend to be much less knowledgeable than whites about cancer's warning signals, and less apt to see a doctor if they experience any of those symptoms. Specifically, the blacks interviewed knew little about three of the cancers that have seen a sharp increase in mortality – colon & rectum, prostate and esophageal. The survey also showed that blacks tend to underestimate both the prevalence of cancer and the chances of cure.

In both studies, most of the differences between whites and blacks were attributed to economic, environmental and social factors rather than to inherent biological characteristics. Because a higher percentage of blacks than whites are in the lower socio-economic group, risk of exposure to industrial carcinogens is increased. Also, limited educational opportunities may prevent early detection as the less educated are less likely to know the importance of symptoms which could lead to an early diagnosis.

TRENDS IN DIAGNOSIS AND TREATMENT

Cancer management today is becoming increasingly individualized with respect to both diagnostic procedures and treatment. Early detection is followed by a precise staging of the disease, and the use of more than one kind of therapy, often in combination.

The following 14 cancers a few decades ago had very poor prognoses – today they are being cured in many cases, predominantly because of chemotherapy advances: acute lymphocytic leukemia, adult myelogenous leukemia, Hodgkin's disease, histiocytic lymphoma, Burkitt's lymphoma, nodular mixed lymphoma, Ewing's sarcoma, Wilms' tumor, rhabdomyosarcoma, choriocarcinoma, testicular cancer, ovarian cancer, breast cancer, osteogenic sarcoma. Other cancers are being more effectively controlled than in the past.

An outstanding example of progress is the improvement in the management of Hodgkin's disease (a cancer of lymph glands in predominantly young adults). Better disease staging in certain cases, more precise application of new and improved x-ray therapy and/or a combination of four cancer drugs has resulted in remarkably improved survival. In less than 10 years, the five-year survival rate for early cases rose from 68 to 90%, and from 10 to 70% for advanced cancers of this type.

The following developments indicate the directions of current and future research:

- Interferon, a natural body substance working at least in part through the immune system, has demonstrated promising anticancer activity. It may herald a whole new class of cancer-fighting compounds called "biologic response modifiers." (See page 24.)
- Thymosin, another biological response modifier, is produced by the thymus gland, the master gland of the body's immune system. Recombinant DNA has helped to synthesize several of the important thymosin hormones. A partially purified thymosin preparation called thymosin fraction 5 has shown promise when used with chemotherapy in significantly prolonging the survival of patients with oat cell carcinoma of the lung, as well as head and neck tumors following radiation therapy.
- A genetic fusing of cancer cells with disease-fighting white blood cells can produce "monoclonal antibodies" – specific antibodies tailored to seek out chosen targets such as cancer. There are already monoclonal antibodies which are effective against malarial parasites, various strains of flu virus and the hepatitis B virus.
- Experiments have been conducted with simple, inexpensive blood tests, in which unique proteins, enzymes, antigens and other substances are used as indicators to determine whether an individual has cancer, and in some cases, where it is. These tests are known by such names as GT-II, CEA, and B-protein. Good preliminary results have been obtained in selected cases by using the procedures to detect cancers of the breast, pancreas and other sites.
- Intense drug therapy before surgery has been suc-

cessful in the treatment of children with bone tumors, and is being adapted to help fight some of the more common cancers in adults.

- A series of chemical injections near the spine can act as a nerve block, relieving certain cancer patients of debilitating pain.
- Retinoids, synthetic "cousins" of Vitamin A, have prevented bladder and breast cancers in mice and rats, and may also work against cancers of the lung, esophagus and pancreas in humans.
- About fifty drugs have been found effective against certain cancers, and others that are still being tested hold promise.
- Surgery now is more precise than in the past because of improved diagnostic equipment and laser instruments, and rehabilitation is improved through advances in plastic surgery.
- Common denominator approaches to cancer prevention may include the study and manipulation of "oncogenes" – cancer-causing genes which normally are dormant but which may be activated by radiation, chemicals and viruses. Researchers have learned how to suppress oncogenes in some animals, and are determining whether the same thing can be done in humans.
- A new technique makes high and potentially lethal doses of the cancer drug, methotrexate, safe and effective for the treatment of some cancers.
- Many patients with bone cancer now are treated successfully by removing and replacing a section of bone rather than by amputating the leg or arm. Drugs and radiation therapy also are being used effectively following surgery, resulting in dramatic improvement in survival.
- High-frequency sound waves (ultrasound), instead of X rays, are being used to locate tumors deep in the body. For patients undergoing radiation therapy, ultrasound may enable the therapist to pinpoint the tumor more precisely in order to provide more accurate radiation dosage and location of the tumor.
- Hyperthermia (the superheating of body tissues) is being used to increase the effectiveness of radiotherapy and chemotherapy.
- Because environmental factors have been found for virtually every major cancer, it is becoming possible to "profile" individuals according to their cancer risk factors, and therefore select the most appropriate time for diagnostic tests.
- The transfusion of blood components is becoming increasingly available and effective for cancer therapy. Platelets are used to prevent hemorrhaging, white cells to treat infection as well as the cancer itself.
- Computerized tomography uses X rays to examine the brain and other parts of the body. Cross-section pictures are constructed which show a tumor's shape and location more accurately than is possible with conventional x-ray techniques.
- Many cancers are caused by a two-stage process through exposure to two different kinds of substances known as initiators and promoters. Researchers are exploring ways of interrupting the process, thereby preventing the development of cancer.

NEW SURVIVAL DATA

New information makes it possible for this 1982 edition of *Facts & Figures* to compare 5-year survival rates for patients diagnosed in the early 1970's (1970-73) with those patients diagnosed 10 years earlier (1960-63). See chart on page 7. Combined white and black survival figures are given in each site section.

The new data come from the SEER program of the National Cancer Institute.

In white males, lung cancer was the most widespread, and survival improved little (7%-9%). The prostate saw a substantial improvement (50%-63%). The most dramatic improvements were for patients with Hodgkin's disease (34%-66%), and the lymphocytic leukemias (3%-29% for acute, 46%-59% for chronic). Improvements were also noted in cancers of the colon, kidney and non-Hodgkin's lymphoma.

In white females, survival for patients with breast cancer, the foremost cause of cancer deaths in women, improved somewhat (63%-68%). More dramatic gains were in non-Hodgkin's lymphoma (31%-43%), uterine corpus (73%-81%) and gains similar to white males in the lymphocytic leukemias.

In black males, the most substantial improvement was for patients with prostate cancer (35%-55%). Gains also were made in cancers of the esophagus (0%-4%), stomach (5%-15%) and colon (32%-36%). Lung cancer, again number one, showed little improvement.

Black females experienced a considerable improvement in survival of patients with cancer of the uterine cervix (47%-61%) and some gain for breast cancer (46%-51%), which has replaced cervical cancer as the most frequent site.

In white children, defined as those under 15 years of age, survival improved for most sites, most dramatically in cases of acute lymphocytic leukemia (4%-34%), which accounted for 20%-25% of all childhood cancers. Data on blacks was insufficient. Other marked improvements in white children were noted in glioma (48%-59%) and neuroblastoma

(25%-40%), the second and third most frequently diagnosed cancers.

Overall, a higher proportion of whites than blacks had cancer diagnosed in an early, localized stage, and survival was generally better.

Urinary bladder cancer was one site where, for both men and women, the survival differential was greatest between whites and blacks (61%-38% for men, 60%-27% for women). Other sites where white and black survival contrasted sharply were the colon, rectum, larynx, breast and uterine corpus.

TRENDS IN SURVIVAL BY SITE OF CANCER, BY RACE
Cases Diagnosed in 1960-63 Compared to Those Diagnosed in 1970-73

	WHITE			BLACK		
Site	1960-63 Relative 5-year Survival (%)	1970-73 Relative 5-year Survival (%)	Increase	1960-63 Relative 5-year Survival (%)	1970-73 Relative 5-year Survival (%)	Increase
Prostate	50	63	13	35	55	20
Kidney	37	46	9	38	44	6
Uterine Corpus	73	81	8	31	44	13
Bladder	53	61	8	24	34	10
Colon/Rectum	41	48	7	31	35	4
Uterine Cervix	58	64	6	47	61	14
Breast	63	68	5	46	51	5
Ovary	32	36	4	32	32	0
Brain and Central Nervous	18	20	2	19	19	0
Lung and Bronchus	8	10	2	5	7	2
Stomach	11	13	2	8	13	5
Esophagus	4	4	0	1	4	3
Hodgkin's Disease	40	67	27			
Lymphocytic Leukemia-Acute	4	28	24			
Lymphocytic Leukemia-Chronic	35	51	16			
Non-Hodgkin's Lymphoma	31	41	10			
Larynx	53	62	9			
Tongue	28	37	9			
Melanoma of Skin	60	68	8			
Pharynx	24	28	4			
Thyroid	83	86	3			
Mouth	44	44	0			

Source: Biometry Branch, National Cancer Institute

NEW CANCER CASES – 1982

Estimated New Cancer Cases for All Sites Plus Major Sites, by State – 1982

State	All Sites *	Major Sites								
	Number of Cases	Female Breast	Colon-Rectum	Lung	Oral	Uterus (Invasive)	Prostate	Stomach	Pancreas	Leukemia
Alabama	14,000	1,600	1,600	2,300	350	1,100	1,200	325	425	425
Alaska	600	50	50	100	15	30	20	15	10	20
Arizona	8,600	1,100	1,300	1,400	275	550	750	175	250	225
Arkansas	8,800	1,000	1,100	1,500	300	650	850	200	300	300
California	82,000	11,300	10,700	13,000	2,600	4,800	7,000	2,500	2,600	2,400
Colorado	7,300	1,000	1,100	1,000	175	400	550	175	250	250
Connecticut	13,000	2,100	2,000	1,800	450	800	1,100	400	400	400
Delaware	2,300	300	350	400	70	150	150	50	50	40
Dist. of Columbia	3,200	450	400	450	200	300	325	90	100	60
Florida	49,000	5,800	6,900	8,200	1,600	2,800	4,500	1,200	1,400	1,300
Georgia	17,000	1,900	1,900	2,900	600	1,200	1,600	400	450	500
Hawaii	2,400	300	300	350	100	125	125	175	60	70
Idaho	2,700	450	300	350	75	200	275	70	80	100
Illinois	43,000	5,900	6,600	6,600	1,500	2,700	3,500	1,400	1,300	1,200
Indiana	20,000	2,700	3,000	3,100	500	1,800	1,500	450	550	550
Iowa	11,000	1,500	2,200	1,600	300	800	1,200	300	350	400
Kansas	8,600	1,200	1,300	1,400	275	700	800	175	300	300
Kentucky	13,000	1,400	1,800	2,500	425	950	1,200	275	375	400
Louisiana	14,000	1,600	1,800	2,300	550	950	1,300	400	400	400
Maine	4,700	600	800	700	150	350	400	150	150	100
Maryland	16,000	2,400	2,300	2,500	650	1,100	1,400	375	400	400
Massachusetts	24,000	3,500	4,100	3,300	900	1,500	2,000	850	650	650
Michigan	31,000	4,300	4,500	4,900	950	2,200	2,900	850	850	900
Minnesota	14,000	2,000	2,200	1,800	375	800	1,500	500	450	475
Mississippi	8,700	850	1,100	1,500	250	600	1,100	250	300	300
Missouri	20,000	2,400	3,100	3,100	550	1,400	1,900	500	550	600
Montana	2,600	300	400	350	80	150	325	80	80	80
Nebraska	5,800	750	1,100	850	150	350	500	175	225	225
Nevada	2,500	300	300	450	60	150	150	15	60	40
New Hampshire	3,600	450	650	500	100	225	275	70	90	125
New Jersey	31,000	4,700	5,000	4,700	1,100	2,100	2,500	1,100	900	800
New Mexico	3,400	400	450	450	60	250	325	80	90	70
New York	73,000	11,300	12,500	10,300	2,600	4,800	5,800	2,800	2,400	2,000
North Carolina	20,000	2,600	2,500	3,000	650	1,400	2,000	400	600	500
North Dakota	2,500	350	400	250	50	125	300	100	80	70
Ohio	41,000	5,900	6,300	6,600	1,300	3,000	3,300	1,200	1,300	1,300
Oklahoma	11,000	1,300	1,600	2,000	375	650	1,000	275	325	325
Oregon	9,500	1,200	1,200	1,500	250	600	850	200	300	300
Pennsylvania	52,000	7,100	9,300	7,300	1,500	3,300	4,000	1,600	1,500	1,300
Rhode Island	4,700	650	850	700	200	300	400	175	150	80
South Carolina	9,400	1,200	1,100	1,500	350	800	900	175	300	250
South Dakota	2,500	400	450	350	50	150	300	80	90	100
Tennessee	17,000	1,900	2,100	2,900	550	1,100	1,500	325	500	475
Texas	43,000	5,100	5,200	7,000	1,500	2,700	3,700	1,200	1,200	1,400
Utah	2,900	450	400	250	60	225	300	80	80	80
Vermont	1,900	250	300	300	60	150	200	50	50	60
Virginia	17,000	2,300	2,200	2,900	550	1,100	1,500	400	475	425
Washington	14,000	2,000	2,000	2,200	450	800	1,300	350	425	450
West Virginia	7,600	850	1,000	1,200	200	600	650	200	250	200
Wisconsin	17,000	2,400	2,700	2,200	550	950	1,700	600	500	550
Wyoming	1,200	150	200	200	20	70	80	20	30	30
United States	835,000	112,000	123,000	129,000	27,000	55,000	73,000	24,000	25,000	24,000
Puerto Rico	6,000	450	450	350	425	750	400	500	100	175

*Does not include carcinoma in situ or non-melanoma skin cancer.

These estimates are offered as a rough guide and should not be regarded as definitive. They are calculated according to the distribution of estimated 1982 cancer deaths by state. Especially note that year-to-year changes may only represent improvements in the basic data.

CANCER DEATHS – 1982

Estimated Cancer Deaths for All Sites Plus Major Sites, by State – 1982

State	All Sites		Major Sites								
	Number of Deaths	Death Rate per 100,000 Population	Female Breast	Colon-Rectum	Lung	Oral	Uterus	Prostate	Stomach	Pancreas	Leukemia
Alabama	7,200	170	500	750	2,100	125	200	375	200	375	250
Alaska	300	63	20	30	75	5	10	10	10	10	10
Arizona	4,700	136	325	550	1,200	100	50	225	125	225	150
Arkansas	4,600	179	325	500	1,400	100	100	275	150	250	200
California	43,000	162	3,700	5,300	11,000	850	900	2,200	1,500	2,200	1,500
Colorado	3,800	111	325	500	850	70	70	225	125	200	175
Connecticut	6,600	209	650	900	1,500	175	125	325	250	350	250
Delaware	1,200	190	80	150	300	25	20	50	30	60	30
Dist. of Columbia	1,600	293	175	200	375	75	60	100	60	90	40
Florida	25,200	210	1,900	3,200	7,100	450	400	1,500	800	1,200	750
Georgia	8,800	143	650	850	2,500	200	250	450	225	425	300
Hawaii	1,200	108	75	150	300	30	20	40	90	60	50
Idaho	1,300	116	100	150	300	25	25	90	40	70	70
Illinois	22,300	191	2,000	3,100	5,700	500	600	1,200	750	1,200	900
Indiana	10,100	177	900	1,500	2,700	200	300	500	250	500	400
Iowa	5,700	191	500	950	1,300	100	125	350	150	325	275
Kansas	4,500	184	425	600	1,300	100	100	300	125	250	200
Kentucky	6,800	170	475	850	2,200	175	175	400	150	350	275
Louisiana	7,400	160	550	750	2,100	175	175	400	250	375	250
Maine	2,400	196	200	350	600	50	60	125	90	100	80
Maryland	8,300	187	700	1,100	2,300	200	175	425	225	375	250
Massachusetts	12,400	215	1,200	1,900	2,900	325	275	600	500	600	425
Michigan	16,300	171	1,400	2,100	4,200	325	400	850	475	800	600
Minnesota	7,200	168	650	1,000	1,600	150	125	475	250	400	325
Mississippi	4,500	163	300	450	1,200	90	100	325	125	275	200
Missouri	10,100	198	800	1,400	2,600	200	250	600	275	475	400
Montana	1,300	151	100	175	325	30	30	100	50	80	60
Nebraska	3,100	189	275	475	700	60	70	200	125	175	150
Nevada	1,300	125	80	150	400	25	20	50	10	60	30
New Hampshire	1,800	169	150	275	425	40	40	90	40	80	70
New Jersey	16,200	216	1,600	2,400	4,000	350	375	750	650	800	500
New Mexico	1,700	112	125	200	350	25	40	80	50	80	50
New York	37,400	220	4,000	5,800	8,800	850	950	1,800	1,600	2,100	1,400
North Carolina	10,100	156	750	1,100	2,600	225	275	550	250	450	375
North Dakota	1,200	176	90	175	200	20	20	90	60	80	50
Ohio	21,200	194	1,900	3,000	5,600	425	600	1,100	650	1,000	800
Oklahoma	5,800	171	400	750	1,700	100	100	325	150	300	225
Oregon	4,800	157	375	550	1,300	100	75	300	125	250	200
Pennsylvania	26,000	218	2,400	4,100	6,200	500	700	1,300	850	1,300	950
Rhode Island	2,400	254	250	400	550	60	40	125	100	100	60
South Carolina	4,800	136	375	500	1,300	100	125	300	125	275	175
South Dakota	1,300	183	100	200	300	20	30	100	50	90	80
Tennessee	8,500	166	600	900	2,400	200	200	450	225	425	300
Texas	22,000	133	1,700	2,400	6,000	425	500	1,100	700	1,200	1,000
Utah	1,500	85	150	175	225	20	30	100	50	75	60
Vermont	950	169	80	150	250	20	30	60	30	50	40
Virginia	8,700	148	750	1,100	2,500	175	225	450	250	425	300
Washington	7,100	152	600	900	2,000	150	150	425	200	375	275
West Virginia	3,900	185	275	475	1,100	75	100	200	100	200	125
Wisconsin	8,800	179	900	1,300	1,900	175	175	500	325	450	350
Wyoming	650	112	50	70	175	10	10	40	15	40	20
United States	430,000	176	37,000	57,000	111,000	9,000	10,000	23,000	14,000	22,000	16,000
Puerto Rico	3,000	84	125	225	300	175	150	225	400	100	150

Estimated New Cancer Cases and Deaths by Sex for All Sites — 1982*

SITE	ESTIMATED NEW CASES			ESTIMATED DEATHS		
	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE
All Sites	835,000*	413,000*	422,000*	430,000	233,000	197,000
Buccal Cavity & Pharynx (Oral)	26,800	18,600	8,200	9,150	6,300	2,850
Lip	4,600	4,100	500	175	150	25
Tongue	4,800	3,200	1,600	2,000	1,400	600
Salivary Gland				700	450	250
Floor of Mouth	9,700	5,800	3,900	525	400	125
Other & Unspecified Mouth				1,550	1,000	550
Pharynx	7,700	5,500	2,200	4,200	2,900	1,300
Digestive Organs	198,600	102,100	96,500	113,500	59,250	54,250
Esophagus	8,900	6,300	2,600	8,300	6,000	2,300
Stomach	24,200	14,600	9,600	13,800	8,200	5,600
Small Intestine	2,100	1,100	1,000	700	350	350
Large Intestine (Colon-Rectum)	85,000	39,000	46,000	48,600	23,000	25,600
Rectum (Colon-Rectum)	38,000	21,000	17,000	8,500	4,600	3,900
Liver & Biliary Passages	13,100	6,100	7,000	9,900	4,800	5,100
Pancreas	24,800	12,800	12,000	22,300	11,600	10,700
Other & Unspecified Digestive	2,500	1,200	1,300	1,400	700	700
Respiratory System	143,000	102,100	40,900	116,100	84,000	32,100
Larynx	10,900	9,100	1,800	3,700	3,100	600
Lung	129,000	91,000	38,000	111,000	80,000	31,000
Other & Unspecified Respiratory	3,100	2,000	1,100	1,400	900	500
Bone, Tissue and Skin	21,500	11,000	10,500	10,300	5,900	4,400
Bone	1,900	1,100	800	1,750	1,000	750
Connective Tissue	4,800	2,600	2,200	1,650	800	850
Skin	14,800**	7,300**	7,500**	6,900+	4,100	2,800
Breast	112,900	900	112,000	37,300	300	37,000
Genital Organs	155,700	78,300	77,400	46,750	24,250	22,500
Cervix, Invasive (Uterus)	16,000***	...	16,000***	7,100	...	7,100
Corpus, Endometrium (Uterus)	39,000	...	39,000	3,000	...	3,000
Ovary	18,000	...	18,000	11,400	...	11,400
Prostate	73,000	73,000	...	23,300	23,300	...
Testis, Other Male Genital	5,300	5,300	...	950	950	...
Other & Unspecified Genital, Female	4,400	...	4,400	1,000	...	1,000
Urinary Organs	55,200	38,300	16,900	18,900	12,300	6,600
Bladder	37,100	27,000	10,100	10,600	7,300	3,300
Kidney & Other Urinary	18,100	11,300	6,800	8,300	5,000	3,300
Eye	1,800	900	900	400	200	200
Brain & Central Nervous System	12,400	6,900	5,500	10,400	5,700	4,700
Endocrine Glands	11,100	3,500	7,600	1,500	600	900
Thyroid	10,100	2,900	7,200	1,050	350	700
Other Endocrine	1,000	600	400	450	250	200
Leukemia	23,500	13,000	10,500	15,900	8,900	7,000
Other Blood & Lymph Tissues	39,600	20,900	18,700	21,100	11,000	10,100
Hodgkin's Disease	7,000	4,000	3,000	1,600	900	700
Multiple Myeloma	9,600	4,900	4,700	6,900	3,500	3,400
Other Lymphomas	23,000	12,000	11,000	12,600	6,600	6,000
All Other & Unspecified Sites	32,900	16,500	16,400	28,700	14,300	14,400

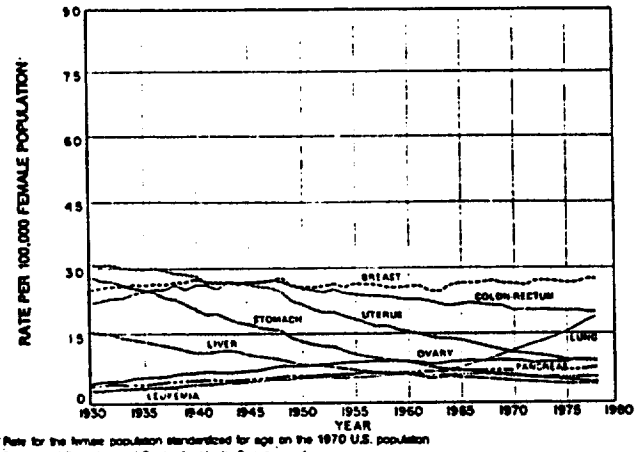
Note: The estimates of new cancer cases are offered as a rough guide and should not be regarded as definitive. Especially note that year-to-year changes may only represent improvements in the basic data. ACS six major sites in boldface.

*Carcinoma in situ and non-melanoma skin cancers not included in totals. Carcinoma in situ of the uterine cervix accounts for over 45,000 new cases annually. Non-melanoma skin cancer accounts for about 400,000 new cases annually.

**Melanoma only ***Invasive cancer only + Melanoma 5,100; other skin 1,800

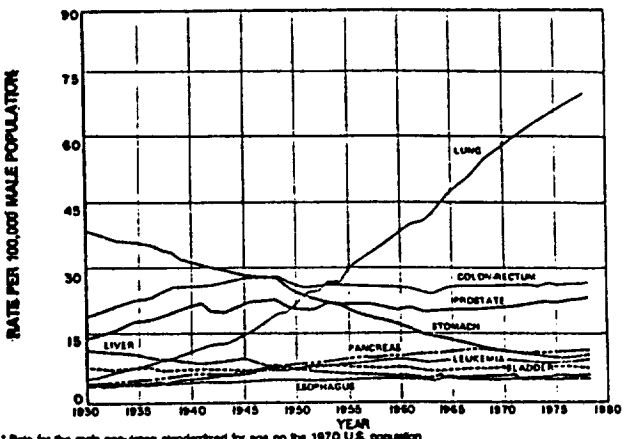
INCIDENCE ESTIMATES ARE BASED ON RATES FROM NCI SEER PROGRAM 1973-1978

FEMALE CANCER DEATH RATES* BY SITE
UNITED STATES, 1930-1978



* Rate for the female population standardized for age on the 1970 U.S. population
Sources of Data: National Center for Health Statistics and Bureau of the Census, United States.

MALE CANCER DEATH RATES* BY SITE
UNITED STATES, 1930-1978



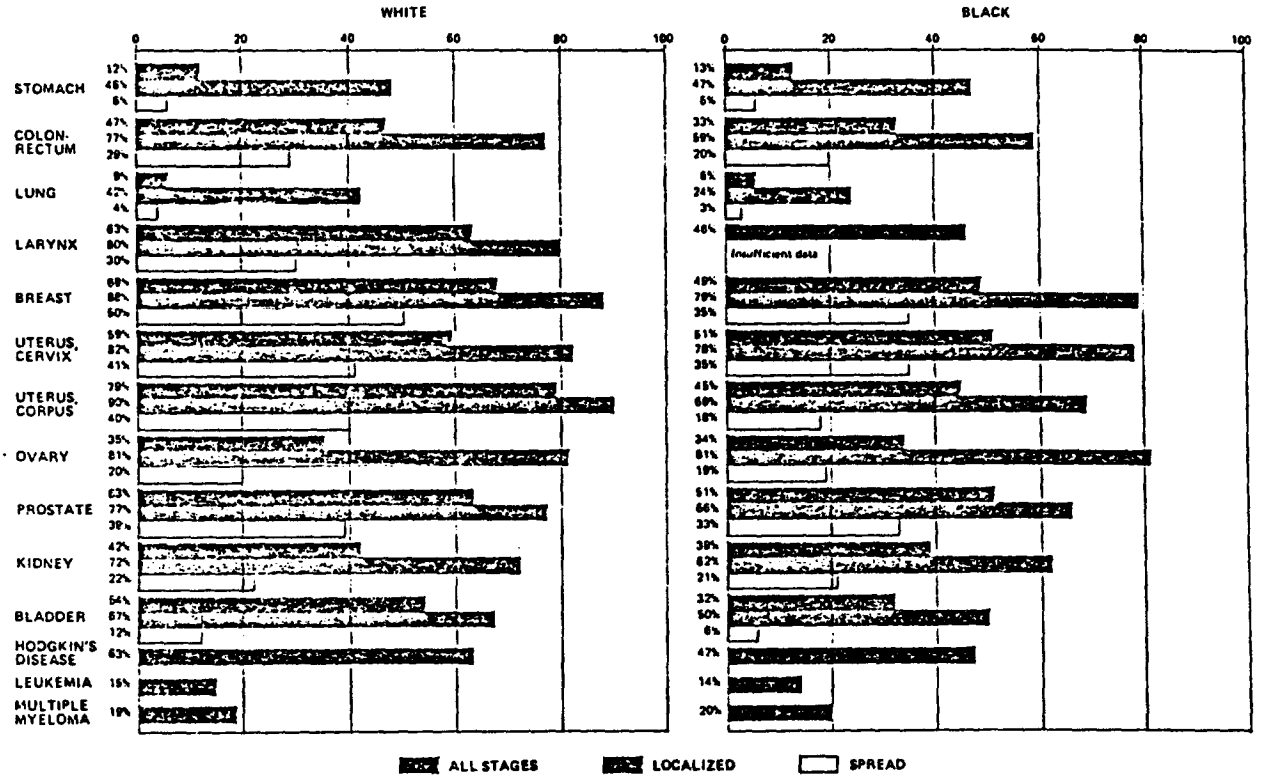
* Rate for the male population standardized for age on the 1970 U.S. population
Sources of Data: National Center for Health Statistics and Bureau of the Census, United States.

25-Year Trends in Age-Adjusted Cancer Death Rates Per 100,000 Population 1951-52 to 1976-78

Sex	Sites	1951-53	1976-78	Percent Changes	Comments
Male	All Sites	171.9	215.7	+ 25	Steady increase mainly due to lung cancer.
Female	All Sites	146.4	136.1	– 7	Slight decrease.
Male	Bladder	7.2	7.2	*	Slight fluctuations; overall no change.
Female	Bladder	3.1	2.1	– 32	Some fluctuations; noticeable decrease.
Male	Breast	0.3	0.3	*	Constant rate.
Female	Breast	26.0	27.1	+ 4	Slight fluctuations; overall no change.
Male	Colon & Rectum	25.8	26.4	*	Slight fluctuations; overall no change.
Female	Colon & Rectum	24.8	20.0	– 19	Slight fluctuations; noticeable decrease.
Male	Esophagus	4.7	5.4	+ 15	Some fluctuations; slight increase.
Female	Esophagus	1.2	1.5	*	Slight fluctuations; overall no change in females.
Male	Kidney	3.4	4.7	+ 38	Steady slight increase.
Female	Kidney	2.1	2.2	*	Slight fluctuations; overall no change.
Male	Leukemia	7.9	8.8	+ 11	Early increase, later leveling off.
Female	Leukemia	5.4	5.2	*	Slight early increase, later leveling off.
Male	Liver	6.7	4.8	– 28	Some fluctuations. Steady decrease in both
Female	Liver	7.6	3.6	– 53	sexes.
Male	Lung	25.5	69.3	+ 172	Steady increase in both sexes due to cigarette
Female	Lung	5.0	17.8	+ 256	smoking.
Male	Oral	5.9	5.8	*	Slight fluctuations; overall no change in both
Female	Oral	1.5	2.0	*	sexes.
Female	Ovary	8.1	8.6	+ 8	Steady increase, later leveling off.
Male	Pancreas	8.6	11.2	+ 30	Steady increase in both sexes, then leveling off.
Female	Pancreas	5.5	7.1	+ 29	Reasons unknown.
Male	Prostate	21.0	22.6	+ 8	Fluctuations all through period; overall no change.
Male	Skin	3.1	3.4	*	Slight fluctuations; overall no change in both
Female	Skin	1.9	1.9	*	sexes.
Male	Stomach	22.8	9.3	– 59	Steady decrease in both sexes; reasons unknown.
Female	Stomach	12.3	4.3	– 65	
Female	Uterus	20.0	8.7	– 57	Steady decrease.

*Percent changes not listed because they are not meaningful.

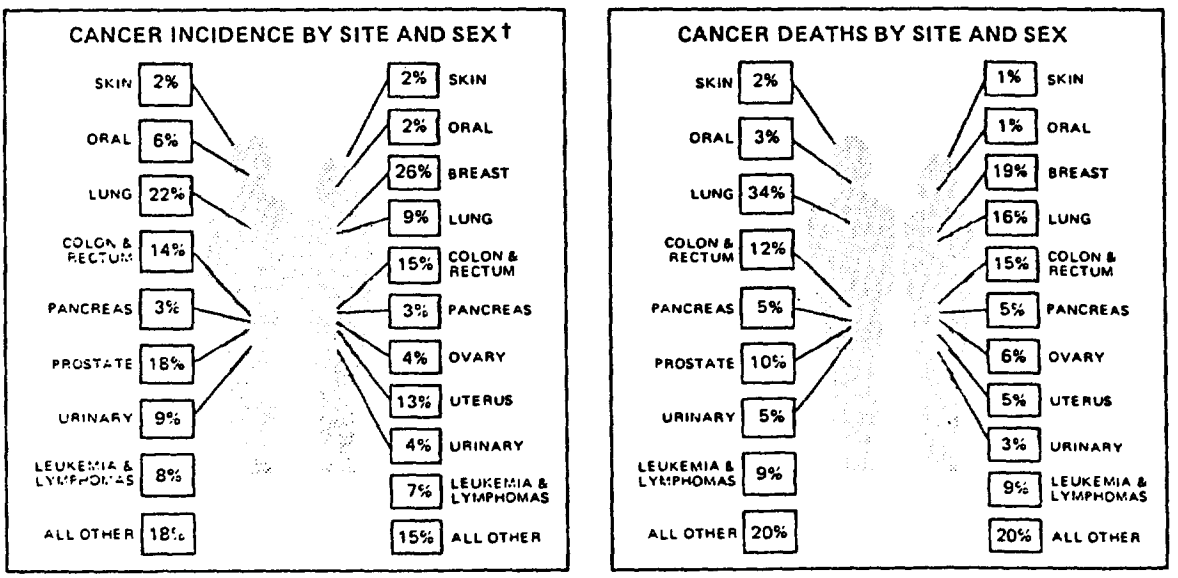
FIVE-YEAR CANCER SURVIVAL RATES* FOR SELECTED SITES BY RACE



*Adjusted for normal life expectancy

Source: Biometry Branch, National Cancer Institute

1982 ESTIMATES



†Excluding non-melanoma skin cancer and carcinoma in situ.

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CANCER AROUND THE WORLD, 1976-1977

Age-adjusted Death Rates Per 100,000 Population for Selected Sites for 42 Countries

Country	All Sites		Oral		Colon & Rectum		Lung		Breast	Uterus	Skin		Stomach		Prostate	Leukemia	
	Male	Female	Male	Female	Male	Female	Male	Female	Female	Female	Male	Female	Male	Female	Male	Male	Female
United States	213.6(17)	136.3(19)	5.8(8)	2.0(7)	26.2(16)	20.2(15)	68.1(6)	17.2(5)	27.3(14)	8.9(30)	3.4(6)	1.9(12)	9.2(37)	4.4(39)	22.3(12)	5.6(23)	5.2(5)
Argentina**	212.5(19)	137.2(18)	4.4(17)	1.0(30)	19.8(22)	17.3(21)	53.9(21)	7.3(22)	24.2(18)	14.0(12)	2.0(22)	1.1(30)	24.0(19)	12.2(22)	17.4(19)	6.7(19)	4.1(25)
Australia	210.5(22)	129.2(25)	5.3(11)	1.5(16)	28.1(12)	22.7(11)	61.6(18)	10.3(14)	24.8(16)	7.9(34)	6.6(1)	3.6(2)	15.7(34)	8.4(36)	22.9(11)	8.0(9)	5.0(11)
Austria	248.7(8)	155.3(7)	5.2(14)	0.9(32)	33.4(3)	22.5(13)	67.6(7)	8.7(15)	24.7(17)	16.3(8)	2.5(11)	1.9(12)	38.5(7)	20.6(7)	21.9(13)	7.1(16)	4.9(13)
Belgium*	266.7(3)	147.7(12)	3.5(27)	0.9(32)	29.0(9)	24.6(7)	91.5(4)	7.2(23)	27.7(13)	10.1(25)	1.7(26)	1.5(24)	23.4(20)	13.6(19)	25.1(4)	8.0(9)	4.8(17)
Bulgaria	158.8(35)	97.7(37)	2.4(37)	0.8(37)	13.5(29)	9.4(32)	44.1(24)	7.7(18)	14.6(29)	9.2(29)	1.4(29)	1.6(18)	36.6(9)	20.3(8)	8.9(33)	5.5(24)	4.1(25)
Canada	211.2(21)	135.3(20)	5.3(11)	1.6(14)	28.6(10)	23.0(9)	62.7(14)	12.5(11)	28.4(12)	8.3(33)	2.0(22)	1.8(15)	15.8(33)	7.2(37)	21.0(15)	8.8(2)	5.0(11)
Chile	197.7(23)	153.8(9)	3.3(30)	0.9(32)	9.9(32)	10.0(30)	25.3(32)	6.9(25)	14.1(30)	22.3(4)	1.7(26)	1.6(18)	64.9(2)	30.4(3)	17.0(21)	4.6(32)	3.7(30)
Costa Rica*	163.8(33)	139.5(16)	3.9(23)	1.7(11)	8.2(36)	8.4(34)	14.8(37)	6.1(28)	11.4(34)	24.4(3)	1.9(24)	0.8(32)	61.1(3)	38.8(1)	15.3(23)	4.4(33)	4.9(13)
Denmark	232.1(12)	170.9(2)	3.1(33)	1.5(16)	32.4(6)	25.9(4)	62.0(15)	15.2(8)	33.8(1)	15.2(11)	3.1(7)	2.7(4)	19.0(29)	9.7(31)	21.1(14)	8.9(1)	5.7(3)
England & Wales	251.5(7)	156.0(6)	3.7(24)	1.7(11)	29.6(8)	22.8(10)	96.5(3)	19.4(4)	33.6(2)	10.4(22)	2.2(18)	1.9(12)	25.1(17)	11.8(24)	18.2(18)	6.6(20)	4.4(20)
France*	255.7(6)	125.2(29)	18.5(3)	1.5(16)	28.0(13)	18.8(18)	48.6(23)	4.6(36)	22.7(21)	11.3(18)	2.2(18)	1.8(15)	20.4(27)	9.4(32)	23.1(9)	8.7(3)	5.2(5)
Germany, D.R.*	211.8(20)	133.8(22)	3.0(34)	0.9(32)	23.3(19)	19.6(16)	67.0(8)	6.0(29)	18.8(24)	15.9(9)	2.3(14)	1.5(24)	34.4(12)	16.4(15)	14.2(24)	7.3(14)	4.2(22)
Germany, F.R.	244.8(9)	154.8(8)	3.5(27)	0.9(32)	32.4(6)	24.8(6)	64.0(12)	6.8(26)	25.1(15)	12.1(15)	2.4(13)	1.6(18)	34.4(12)	18.3(10)	24.1(5)	8.2(7)	5.2(5)
Greece	185.8(28)	103.6(35)	2.2(39)	3.0(5)	8.8(35)	9.2(33)	55.3(20)	8.2(16)	15.1(28)	7.4(35)	1.4(29)	1.5(24)	17.6(31)	10.6(28)	9.7(31)	8.4(6)	5.2(5)
Honduras*	24.5(42)	37.8(40)	0.6(41)	0.4(41)	0.2(41)	0.7(41)	0.6(41)	0.4(42)	0.1(41)	2.7(41)	0.0(41)	0.1(39)	5.5(40)	3.7(40)	0.2(40)	2.1(40)	1.3(41)
Hong Kong	229.1(14)	125.3(28)	21.2(1)	7.1(1)	16.9(24)	11.9(27)	65.6(9)	30.4(1)	10.7(36)	12.1(15)	1.1(33)	0.6(36)	5.8(39)	9.2(33)	2.9(37)	3.8(35)	3.1(36)
Hungary	256.9(5)	163.6(4)	7.6(7)	1.4(20)	28.5(11)	22.6(12)	65.0(11)	11.2(12)	23.8(19)	19.6(5)	3.6(5)	2.9(3)	47.4(4)	22.6(4)	23.9(6)	7.6(13)	5.1(10)
Iceland	170.1(31)	138.7(17)	3.7(24)	1.8(10)	18.4(23)	16.0(24)	24.7(33)	14.8(9)	22.2(23)	6.5(38)	1.0(35)	0.0(41)	37.7(8)	21.5(6)	19.2(17)	5.0(27)	3.3(34)
Ireland*	225.2(15)	161.0(5)	5.3(11)	2.7(6)	36.0(1)	27.2(2)	61.8(16)	16.9(6)	32.0(6)	7.2(36)	2.1(20)	2.0(10)	25.1(17)	14.2(17)	23.0(10)	6.2(22)	3.6(31)
Israel	170.5(30)	141.3(14)	2.3(38)	1.5(16)	21.4(20)	16.6(23)	32.9(28)	10.5(13)	29.2(10)	5.8(39)	2.5(11)	1.6(18)	18.4(39)	9.2(33)	11.1(29)	8.7(3)	5.9(1)
Japan	186.7(27)	108.7(33)	2.2(39)	0.8(37)	15.0(26)	11.1(28)	28.3(31)	8.2(16)	5.7(39)	11.8(17)	1.0(35)	0.7(34)	70.2(1)	34.9(2)	3.6(35)	4.8(31)	3.3(34)
Malta & Gozo	185.1(29)	114.7(31)	9.5(4)	2.0(7)	15.3(25)	13.3(25)	50.3(22)	5.1(34)	33.4(3)	8.7(31)	1.8(25)	1.4(28)	30.1(14)	10.5(29)	11.2(28)	5.0(27)	4.8(17)
Maritius	100.5(37)	66.9(38)	3.7(24)	1.2(25)	9.9(32)	5.8(37)	15.9(36)	3.7(37)	7.9(37)	11.3(18)	0.5(38)	0.5(37)	22.0(24)	10.5(29)	4.4(34)	2.9(38)	2.4(40)
Netherlands	261.6(4)	142.6(13)	2.5(36)	0.8(37)	26.9(14)	21.1(14)	97.7(2)	6.2(27)	31.5(7)	9.3(28)	2.3(14)	1.6(18)	28.2(15)	13.0(21)	23.8(7)	8.0(9)	5.2(5)
New Zealand	221.0(16)	150.7(10)	4.3(20)	1.7(11)	33.0(4)	30.0(1)	65.6(9)	13.5(10)	30.0(9)	10.2(24)	6.4(2)	3.8(1)	19.1(28)	8.5(35)	23.8(7)	8.5(5)	4.9(13)
Nicaragua*	30.6(41)	30.9(41)	0.0(42)	0.0(42)	0.0(42)	0.0(42)	0.4(42)	0.5(41)	0.0(42)	1.4(42)	0.0(41)	0.0(41)	2.8(41)	0.6(42)	0.0(42)	3.2(37)	3.0(38)
Northern Ireland	229.6(13)	150.4(11)	3.3(30)	1.6(14)	33.5(2)	25.5(5)	71.7(5)	16.0(7)	33.0(5)	8.4(32)	2.1(20)	2.1(7)	23.4(10)	14.3(16)	19.9(16)	7.3(14)	3.5(32)
Norway	188.0(26)	131.2(23)	4.3(20)	1.1(27)	23.4(18)	19.4(17)	30.5(30)	5.9(31)	22.6(22)	9.9(26)	4.6(3)	2.6(5)	23.8(27)	11.8(24)	29.8(2)	6.6(20)	4.9(13)
Paraguay*	104.1(36)	120.2(30)	4.0(22)	1.1(27)	8.1(37)	5.0(38)	9.6(38)	2.7(39)	17.0(25)	36.3(1)	1.5(28)	0.5(37)	23.9(22)	12.1(23)	12.9(26)	5.2(26)	4.4(20)
Philippines*	62.2(39)	55.1(39)	5.7(10)	4.5(3)	12.8(30)	3.6(39)	8.7(39)	3.6(38)	6.7(38)	7.1(37)	1.1(33)	0.7(34)	7.0(38)	5.5(38)	1.9(38)	3.5(36)	2.8(39)
Poland	213.4(18)	126.4(27)	5.8(8)	1.3(22)	14.5(28)	11.1(28)	60.2(19)	7.5(20)	16.3(26)	15.7(10)	0.5(38)	2.1(7)	44.6(5)	17.5(12)	10.2(30)	6.8(18)	4.2(22)
Romania	161.3(34)	105.7(34)	4.4(17)	1.1(27)	9.6(34)	8.0(35)	37.7(26)	7.2(23)	13.3(32)	18.9(6)	2.3(14)	1.6(18)	36.5(10)	16.7(14)	12.5(27)	4.9(29)	3.5(32)
Scotland	269.8(2)	165.8(3)	4.4(17)	1.9(9)	32.7(5)	26.5(3)	108.5(1)	23.1(2)	31.3(8)	10.5(21)	2.8(9)	2.0(10)	25.4(16)	13.4(20)	17.2(20)	6.9(17)	4.2(22)
Singapore	242.1(10)	127.7(26)	18.9(2)	6.3(2)	21.2(21)	16.7(22)	64.0(12)	20.3(3)	11.4(34)	12.7(14)	0.5(38)	0.8(32)	42.2(6)	18.2(11)	3.0(36)	4.9(29)	3.1(36)
Spain*	192.5(25)	109.9(32)	4.8(15)	0.8(37)	7.4(38)	12.8(26)	18.7(35)	4.8(36)	15.8(27)	10.3(23)	1.0(35)	1.3(29)	15.9(32)	16.8(13)	9.7(31)	2.8(39)	4.1(25)
Sweden	197.5(24)	140.9(15)	3.4(29)	1.4(20)	25.0(17)	18.6(19)	33.4(27)	7.7(18)	23.5(20)	9.6(27)	3.1(7)	1.7(17)	20.9(25)	10.8(27)	32.3(1)	7.9(12)	5.6(4)
Switzerland	236.8(11)	134.2(21)	8.0(6)	1.3(22)	26.6(15)	17.6(20)	61.7(17)	5.9(31)	28.6(11)	11.2(20)	3.8(4)	2.4(6)	12.0(36)	11.6(25)	28.5(3)	8.1(8)	4.7(19)
Thailand	37.1(40)	24.8(42)	2.6(35)	1.3(22)	3.8(40)	1.2(40)	4.9(40)	1.9(40)	0.9(40)	3.3(40)	1.3(32)	0.1(39)	1.8(42)	0.8(41)	0.2(40)	0.6(41)	0.4(42)
Uruguay*	294.6(1)	180.3(1)	8.3(5)	1.2(25)	14.6(27)	24.5(8)	32.5(29)	6.0(29)	33.3(4)	17.3(7)	1.4(29)	0.9(31)	20.8(26)	18.4(9)	1.6(39)	0.4(42)	5.8(2)
Venezuela	65.4(38)	130.3(24)	3.3(30)	3.1(4)	7.1(39)	8.0(35)	21.3(34)	5.2(33)	12.1(33)	27.5(2)	2.7(10)	2.1(7)	35.0(11)	22.5(5)	16.3(22)	4.0(34)	3.6(31)
Yugoslavia	166.5(32)	101.9(36)	4.5(16)	1.0(30)	12.3(31)	10.0(30)	43.3(25)	7.4(21)	13.9(31)	12.8(13)	2.3(14)	1.5(24)	15.3(35)	14.0(18)	13.5(25)	5.5(24)	3.8(29)

NOTE: Figures in parentheses are order of rank within site and sex group. *1976 only. **1977 only.

Source of Data: World Health Statistics Annual 1979-1980

LUNG CANCER

Incidence: An estimated 129,000 new cases in 1982.

Mortality: An estimated 111,000 deaths in 1982. The age-standardized lung cancer death rate for women is now approaching that of colorectal cancer, and by the mid-1980's may well surpass breast cancer to become the number one cancer killer of women.

Warning Signals: A persistent cough; sputum streaked with blood; chest pain; recurring attacks of pneumonia or bronchitis.

Risk Factors: Heavy cigarette smoking; history of smoking 20 or more years; exposure to certain industrial substances such as asbestos—particularly for those who smoke.

Early Detection: Lung cancer is very difficult to detect early. If a smoker quits at the time of early cellular changes, the damaged bronchial lining often returns to normal. Continued smoking in many cases causes the cells to form abnormal growth patterns that lead to cancer. Diagnosis may be aided by such procedures as the chest X ray, sputum cytology test and the fiberoptic bronchoscope.

Treatment: Surgery, radiation therapy and chemotherapy. Surgery is usually the treatment of choice, and with improved ventilation machinery and better antibiotics, surgical complications are infrequent. Since a third of all surgical lung cancer patients experience tumor spread, radiation therapy and chemotherapy are frequently used as well as surgery.

Survival: Only 9% of lung cancer patients, all stages, whites and blacks, live five or more years after diagnosis. The percentage is 39 for cases detected in a localized stage; 20% of lung cancers are discovered that early. Rates have improved only slightly over a recent 10-year period. Since lung cancer grows more slowly in women than in men, women with the disease generally live longer than men.

SMOKING

Smoking is responsible for about 83% of lung cancer cases among men, and 43% among women — more than 75% overall.

It also has been implicated in cancer of the mouth, pharynx, larynx, esophagus, pancreas and bladder. Smoking accounts for about 20% of all cancers, and is linked to conditions ranging from colds and gastric ulcers to chronic bronchitis, emphysema and heart disease. Smoking-related disorders are estimated to cause some 325,000 premature deaths each year, and cost the nation about $27 billion in medical care.

The 1979 U.S. Surgeon General's Report, a compendium of 22 scientific papers compiled by 12 government agencies, declared:

"Cigarette smoking is the single most important environmental factor contributing to premature mortality in the United States."

THE CHANGING CIGARETTE

A 1981 supplementary Surgeon General's Report, entitled *The Changing Cigarette*, advises smokers who are not yet able to quit entirely to switch to lower tar and nicotine (T/N) brands.

However, the Surgeon General — strongly supported by the ACS — stressed that there is no truly "safe" cigarette.

Moreover, the report warned that the benefits of low T/N cigarettes are valid only if smokers "do not increase their smoking or change their smoking in other ways . . ." If they try to compensate for the reduction of T/N, they may "negate any advantage of the lower yield product, or even increase the health risk."

Low tar cigarettes — defined as those with 15 mg or less — have grown from 3.6% of all cigarettes consumed in the United States in 1970, to nearly 50% today. The average T/N content of today's cigarette is about 10 mg of tar and about 0.8 mg of nicotine. In 1954, those figures were 37 mg of tar and 2 mg of nicotine.

OTHER INGREDIENTS

Besides tar and nicotine, cigarette smoke contains poisonous gases — hydrogen cyanide, volatile aromatic hydrocarbons and especially carbon monoxide, which the Surgeon General's Report cites as a possible critical factor in coronary heart disease and fetal growth retardation, among other things.

The Surgeon General also warns that "in recent years, a number of flavoring additives or cellulose-

based tobacco substitutes may have been included in manufactured cigarettes. The nature and amounts of such additives as actually used are not known . . ."

GOVERNMENT REGULATION

The 1981 report explains that no Federal agency exercises any regulatory authority in the manufacturing of cigarettes, or requires the disclosure of information on additives used by cigarette firms. It states, however, that "some additives available for use are either known or suspect carcinogens, or give rise to carcinogenic substances when burned."

The American Cancer Society recently urged Congress to appoint the Food and Drug Administration as cigarette watchdog, and to require cigarette manufacturers to disclose the chemical composition of their products.

MATERNAL, INDUSTRIAL HAZARDS

The Surgeon General has linked maternal smoking directly with a slowing of fetal growth and an increase in the risk of the infant dying at or shortly after birth. There is evidence that children of mothers who smoke may have deficiencies in physical growth, intellectual development and/or emotional development.

Industrial workers are especially susceptible to lung diseases due to the combined effects of cigarette smoking and exposure to toxic industrial substances. These include fumes from rubber and fluorocarbon polymers, chlorine and dust from cotton and coal. Exposure to asbestos in combination with cigarette smoking increases an individual's cancer risk about 60 times.

A DECLINE IN SMOKING

There is now evidence that Americans are giving up the smoking habit altogether in increasing numbers. While some 54 million continue to smoke more than 630 billion cigarettes each year, there are 33.3 million ex-smokers, up from 31.5 million three years ago.

The proportion of adults who smoke also has been declining, men from 43.5% in 1970 to 36.7% in 1980, and women from 31.1% to 28.9%. Per capita adult smoking has fallen from 4,345 in 1963 to 3,924 in 1980. However, the average smoker is smoking more heavily. In 1970, 23.3% of adult smokers consumed 25 or more cigarettes per day, while in 1980, the figure was 28.6%.

The levels of teenage smoking that climbed alarmingly in the late 1960's and early 1970's have dropped in recent years. Although more girls than boys still smoke, the proportion of girls under 19 who are regular cigarette smokers slipped from 15% in 1974 to 13% in 1979. Regular teenage boy smokers dwindled from 16% to 11% in the same period.

BREAST CANCER

Incidence: An estimated 112,000 new cases in the United States during 1982. About one out of 11 American women will develop breast cancer at some time during their lives.

Mortality: An estimated 37,300 deaths in 1982. It is the foremost site of cancer deaths in women.

Warning Signals: Breast changes that persist such as a lump, thickening, swelling, dimpling, skin irritation, distortion, retraction or scaliness of the nipple, nipple discharge, pain or tenderness.

Risk Factors: Over age 50; personal or family history of breast cancer; never had children; first child after age 30.

Early Detection: The American Cancer Society recommends the monthly practice of breast self-examination (BSE) by women of all ages, beginning during the high school years, as a routine good health habit. Most breast lumps are not cancer but only a physician can make a diagnosis.

The American Cancer Society and the National Cancer Institute, in their joint Breast Cancer Detection Demonstration program, found that mammography – a low-dose x-ray examination – could detect many more early breast cancers than does palpation.

Besides its effectiveness in screening women without symptoms, mammography is recognized above all as a most valuable diagnostic technique for women who have symptoms that might suggest breast cancer.

The Society recommends a mammogram every year for asymptomatic women over age 50, and a baseline mammogram for those between 35 and 40. Women 40 to 50 should consult their physicians on whether and how frequently they need mammography.

Techniques such as thermography (heat patterns), ultrasound (high frequency sound waves) and diaphonoscopy (inspection with a beam of light) are currently being studied for their possible effectiveness in detecting early breast cancer. At present, however, these techniques are not considered as effective as mammography for this purpose.

A professional breast examination is recommended every three years for women 20 to 40, and every year for those over 40.

Treatment: Several therapies may be used, depending on the individual's situation – surgery of varying extent, radiation therapy, chemotherapy or hormone manipulation. Often two or more therapies may be used in combination. The patient should discuss with the physician possible options available concerning specific management of the breast cancer.

New techniques in recent years have made breast reconstruction after mastectomy possible with good cosmetic results. Reconstruction now has become an important part of treatment and rehabilitation.

Survival: The five-year survival rate for early, localized breast cancer has risen from 78% in the 1940's to 87% today. If the cancer has spread, however, the rate is only 47%. The difference in 5-year survival for localized breast cancer between whites and blacks is moderate: 88% compared with 79%.

Despite an increasing incidence of breast cancer, longer survival has helped to stabilize mortality rates over the last 50 years.

UTERINE CANCER

Incidence: An estimated 55,000 new invasive cases in 1982, including 16,000 cases of cancer of the cervix, and 39,000 cases of cancer of the endometrium – or body of the uterus. Cervical cancer incidence has steadily decreased over the years. It is most common today among low socioeconomic groups. Endometrial cancer mostly afflicts mature women, and diagnosis usually is made between the ages of 50 and 64.

Mortality: An estimated 7,100 deaths in 1982 from cervical cancer, 3,000 from endometrial cancer. Overall, the death rate from uterine cancer has decreased more than 70% during the last 40 years, due, in part, to the Pap test and regular checkups. It has the fifth highest cancer death rate in women, after breast, colon-rectum, lung and ovary.

Warning Signals: Unusual bleeding or discharge.

Risk Factors: For cervical cancer, early age at first intercourse, multiple sex partners. For endometrial cancer: history of infertility; failure of ovulation; estrogen therapy; late menopause; combination of diabetes, high blood pressure and obesity.

Early Detection: The Pap test, an examination under a microscope of cells from the cervix and body of the uterus, is a simple procedure which can be performed at appropriate intervals by physicians as part of every pelvic examination. A Pap test is recommended at least once every three years after two initial negative tests one year apart.

The Pap test is highly effective in detecting early cancer of the uterine cervix; it is only 40% effective in detecting endometrial cancer. Women at high risk of developing endometrial cancer should have an endometrial tissue sample at menopause.

Estrogen, which is a hormone, is given to women during and after menopause to make up for the decline in estrogens normally produced by the ovaries. Estrogen helps to control menopausal symptoms such as hot flashes or thinning of the vaginal lining causing painful sexual intercourse.

For older women, there are certain risks associated with such treatment, including an increased risk of endometrial cancer. However, intermittent estrogen can be given under careful physician control.

Treatment: Uterine cancer generally is treated by surgery or radiation, or by a combination of the two. In precancerous stages, changes in the cervix may be treated by cryotherapy, the destruction of cells by extreme cold, or by electrocoagulation, the destruction of tissue through intense heat by electric current. Precancerous endometrial changes may be treated with the hormone progesterone.

Survival: The 5-year survival rate for cervical cancer patients, whites and blacks, is 57%. For patients diagnosed early, however, the rate is 81%. The same figures for endometrial cancer are 75% all stages, 88% early. During a recent 10-year period, there was moderate improvement for both uterine sites.

COLON AND RECTUM CANCER

Incidence: An estimated 123,000 new cases in 1982, including 85,000 of colon cancer and 38,000 of rectum cancer. Colon cancer is second only to lung cancer in the estimated number of new cases (excluding non-melanoma skin cancer).

Mortality: An estimated 57,100 deaths in 1982, second only to lung cancer.

Warning Signals: Unusual bleeding, change in bowel habits.

Risk Factors: Personal or family history of colon and rectum cancer; personal or family history of polyps in the colon or rectum; ulcerative colitis.

There is evidence that bowel cancer may be linked to environmental factors, such as dietary patterns. Some scientists believe that a diet high in beef and/or deficient in fiber content may be a significant causative factor. Ongoing research in this area may reveal important answers.

Early Detection: The ACS recommends three tests as valuable aids in detecting colon and rectum cancer early.

The digital rectal examination is performed by a physician during an office visit. The ACS recommends one every year after age 40.

The stool guaiac slide test, done by the patient at home, is a simple method of testing the feces for hidden blood. The ACS recommends the test every year after age 50.

Proctosigmoidoscopy, known as the "procto," is an examination which inspects the rectum and lower colon with a hollow, lighted tube, traditionally 25 cm long. As the site of most colorectal cancer appears to be shifting higher in the colon, longer, flexible instruments are being developed. Currently under clinical testing is a new 35 cm sigmoidoscope thought to be more suited to routine use in doctors' offices. It is expected to be able to detect more than 60% of all colorectal cancers. The ACS recommends a procto every 3 to 5 years after the age of 50, following two annual exams with negative results.

If any of these tests reveals possible problems, a physician may recommend more extensive studies, such as colonoscopy. The longest available colonoscope is capable of viewing the entire colon with a flexible, lighted tube. The colonoscope also can biopsy suspicious tissue.

Treatment: Surgery is the most effective method of treating colorectal cancer, but radiation and chemotherapy are being used in combination with surgery in some cases.

When surgery is extensive – almost exclusively in the case of rectal cancer – an opening called a stoma is made in the abdominal wall for the elimination of body wastes. The procedure, known as a colostomy, may be either temporary or permanent. The Society has a special program to help patients adjust to the surgery. Most cases of colon cancer, however, do not require permanent colostomies.

Survival: When cancer is detected and treated in an early, localized stage, the 5-year survival rate is 76% for colon cancer and 73% for rectal cancer, compared with 28% and 23% respectively, after the cancer has spread to other parts of the body.

SKIN CANCER

Incidence: An estimated 400,000 cases a year, the vast majority of which are highly curable basal or squamous cell cancers. More common at latitudes near the equator. The most serious skin cancer is malignant melanoma, which strikes about 15,000 men and women each year.

Mortality: An estimated 6,900 deaths in 1982, 5,100 from malignant melanoma and 1,800 due to other skin cancers.

Warning Signals: Any unusual skin condition, especially a change in the size or color of a mole or other darkly pigmented growth or spot.

Risk Factors: Excessive exposure to the sun; fair complexion; occupational exposure to coal tar, pitch, creosote, arsenic compounds and radium. In the black population, because of heavy skin pigmentation, skin cancer is negligible.

Prevention & Early Detection: Most skin cancer is caused by the ultraviolet rays of the sun, through overexposure such as excessive suntan and sunburn.

Avoid the sun between 10 a.m. and 3 p.m., when ultraviolet rays are strongest, and wear protective clothing. Use one of the growing number of sunscreen preparations, especially those containing ingredients such as PABA (para-aminobenzoic acid). They come in varying strengths, ranging from those that permit gradual tanning to those allowing practically no tanning at all.

Basal and squamous cell skin cancers often take the form of a pale, waxlike, pearly nodule, or a red, scaly, sharply outlined patch.

Melanomas are usually distinguished by a dark brown or black pigmentation. They start as small, mole-like growths that increase in size, change color,

become ulcerated and bleed easily from a slight injury.

Treatment: There are four methods of treatment—surgery, radiation therapy, electrodesiccation (tissue destruction by heat), or cryosurgery (tissue destruction by freezing).

For malignant melanoma, wide and deep surgical excision and removal of nearby lymph nodes are often required.

Survival: For basal cell and squamous cell cancers, cure is virtually assured with early detection and treatment.

Malignant melanoma, however, metastasizes quickly. This fact accounts for the lower 5-year survival rate for white patients with this disease – 68%, compared with 95% for other kinds of skin cancer.

ORAL CANCER

Incidence: An estimated 27,000 new cases in 1982. Incidence is more than twice as high in males as in females, and is most frequent in men over age 40. Cancer can affect any part of the oral cavity, from lip to tongue to mouth and throat.

Mortality: An estimated 9,150 deaths in 1982.

Warning Signals: A sore that bleeds easily and doesn't heal; a lump or thickening; a reddish or whitish patch that persists; difficulty in chewing, swallowing or moving tongue or jaws.

Risk Factors: Heavy smoking and drinking; use of chewing tobacco.

Early Detection: Dentists have the opportunity, through regular checkups, to see abnormal tissue changes and to detect cancer at an early and curable stage.

Treatment: Principal methods are surgery and radiation therapy.

Survival: Five-year survival rates vary substantially, depending on the site, and include slight declines as well as improvements over a recent 10-year period. Rates range from 22% for cancer of the pharynx to 84% for lip cancer. Overall, 5-year survival for oral cancer patients is about 40%.

LEUKEMIA

Incidence: An estimated 23,500 new cases in 1982, about half of them acute leukemia, and half of them chronic leukemia. Although it is often thought of as primarily a childhood disease, leukemia strikes many more adults (21,000 cases per year compared with 2,500 in children). Acute lymphocytic leukemia accounts for about 1,800 of the cases of leukemia among children, whereas in adults the most common types are acute granulocytic (about 6,800 cases annually), and chronic lymphocytic (7,600 cases annually).

Mortality: An estimated 15,900 deaths in 1982.

Warning Signals: Acute leukemia in children appears suddenly, with symptoms similar to those of a cold, and progresses rapidly. Lymph nodes, spleen and liver become enlarged with white blood cells that accumulate in those organs. Early signs may include fatigue, paleness, weight loss, repeated infections, easy bruising, nose bleeds or other hemorrhages. Symptoms of advanced leukemia include extreme fatigue, massive hemorrhages, pain, swelling of gums and various skin disorders. Chronic leukemia progresses slowly and without warning signs. Symptoms, similar to those of acute leukemia, may not appear for years.

Risk Factors: Leukemia, a cancer of the blood-forming tissues, strikes both sexes and all ages. Causes of most cases are unknown. There is some evidence of inherited susceptibility, although not for direct transmission from parent to child. Individuals with Down's syndrome (mongolism) and certain other hereditary abnormalities have higher than normal incidence of leukemia. It has also been linked to excessive exposure to radiation and certain chemicals such as benzene.

Early Detection: Leukemia may be difficult to detect early because symptoms often appear to be those of other less serious conditions. When a physician does suspect leukemia, a diagnosis can be made through blood tests and a biopsy of bone marrow.

Treatment: Chemotherapy is by far the most effective method of treating leukemia patients. Today, continuing research in 80 U.S. medical centers is yielding new and better drugs for treating leukemia patients. A variety of anticancer drugs are

used singly or in combinations. All blood-forming tissues release millions of each type of cells daily into one of the body's two circulatory systems—the blood vessel system and the lymph system. When leukemia strikes, millions of abnormal, immature white blood cells called leukocytes are released into these circulatory systems.

Because these cells are immature, they cannot carry out their basic function of fighting infection. In advanced leukemia, the uncontrolled multiplication of abnormal cells results in crowding out the production of normal white cells to fight infection, of platelets to control hemorrhaging and of red blood cells to prevent anemia. Blood transfusions and antibiotics are used as supportive treatment.

Survival: The overall, average 5-year survival rate for white patients with leukemia (black information insufficient) is 15%, due partly to very poor survival of patients with some types of leukemia such as acute granulocytic. Over a recent 10-year period, however, there was a dramatic improvement in survival of patients with acute lymphocytic leukemia: 4%-27% in white males, 3%-29% in white females, and 4%-34% in white children. Moreover, in some medical centers, optimum treatment has raised survival of children with acute lymphocytic leukemia to between 50% and 75%.

CANCER IN CHILDREN

Incidence: An estimated 6,000 new cases in 1982, making it rare as a childhood disease. Cancers in children, however, tend to develop more quickly than adult cancers because body tissues are growing rapidly and cancer grows right along with them. Common childhood cancer sites include the blood, bone, brain, nervous system and kidneys.

Mortality: An estimated 1,700 deaths in 1982, about half of them from leukemia. Despite its rarity, cancer is still the chief cause of death by disease in children between the ages of 3 and 14. Mortality among children with cancer has declined from 8.3 per 100,000 in 1950 to 4.4 in 1978.

Early Detection – General: Cancers in children often are difficult to recognize since they may seem like trivial disorders at first. Parents should see that their children have regular medical checkups, and be alert to any unusual symptoms that persist. Such conditions include nausea, swelling, double vision, stumbling, nosebleeds, drowsiness and listlessness.

Main Childhood Cancers:

Leukemia (See preceding section).

Osteogenic Sarcoma is a bone cancer which develops most often in the forearm or lower leg. There is usually no pain at first, but eventually swelling and difficulty in using the arm or leg occur.

Cancers of the Nervous System, known as neuroblastomas, can appear anywhere but usually in the abdomen, where a swelling occurs.

Brain Cancers in early stages may cause blurred or double vision, dizziness, difficulty in walking or handling objects, and nausea.

Lymphomas are cancers that attack the lymph nodes, bone marrow and various organs throughout the body. They may cause swelling of lymph nodes in the neck, armpit, or groin. Other symptoms may include general weakness and possibly fever.

Eye Cancers usually occur in children under the age of four. When detected early, cure is possible with appropriate treatment.

Cancer of the Kidney, or Wilms' Tumor, may be recognized by a swelling or lump in the abdomen.

Treatment: Childhood cancers are frequently treated by a combination of therapies, coordinated by a team of experts. They include medical specialists, pediatric nurses, social workers and psychologists who work with the child and his or her family.

Survival: Five-year survival rates for cancer in children vary considerably, depending on the site. Among those for white children (black information insufficient) are: bone cancer, 30%; neuroblastoma, 40%; glioma (brain), 59%; Wilms' tumor (kidney), 70%; retinoblastoma (eye), 85%; and Hodgkin's disease, 90%.

PUBLIC EDUCATION

The Society's Public Education programs help save lives by demonstrating simple ways to prevent some cancers and detect others early, when the chance of cure is greatest.

P-A-C-E STRATEGY

The successful planning strategy for P-A-C-E (Priority Activities in Cancer Education)—focuses on four of the six sites where the most lives can be saved: lung, colon & rectum, breast and uterus.

P-A-C-E's balanced approach to Public Education programming is aimed at all segments of the population, with an initial thrust of reaching people in the workplace. Last year, there was a 20% increase in employees who participated in community-level cancer education programs.

POSITIVE HABITS, PERSONAL CONTACT

Public Education stresses that individuals can help protect themselves against cancer by adopting positive health habits and following the ACS Guidelines for the Early Detection of Cancer in People Without Symptoms (page 28). The Society recommends that individuals talk with their physicians and ask how these guidelines apply to them.

Special emphasis is placed on programs involving person-to-person contact and the combination of instruction, discussion and the opportunity to practice recommended health actions.

TARGET GROUPS

The Society's Public Education programs are divided into two major audience categories: adults and youths. Adults are reached through employee education programs, clubs and other organizations, home and neighborhood-oriented activities and cooperative efforts with community health agencies.

Programs targeted to young people are grouped by school grade levels: kindergarten through sixth, seventh through ninth, and tenth through twelfth. Instruction begins with an introduction to good health habits, helps develop a growing decision-making responsibility, and finally focuses on personal health behavior as it relates to cancer.

The Society reinforces its Public Education messages with a variety of films, filmstrips, pamphlets and posters. Whenever possible, volunteers are selected on the basis of professional skills that can be readily adapted to Society work, such as ex-smokers with group experience who can lead quit-smoking clinics, and nurses who can teach breast self-examination to groups of women.

REACHING MORE PEOPLE

Last year, local ACS Public Education programs involving two-way communication reached 10 million adults and over 20 million young people: some 3 million more than the previous year.

In addition to the Society's intensive, person-to-person educational outreach, broader ACS programs blanket the nation with lifesaving messages.

During the annual ACS Cancer Crusade, trained volunteers make personal home visits, urging individuals to protect themselves against cancer.

More than 78 million educational leaflets are distributed each year, and important cancer educational messages reach nearly every U.S. household through TV, radio and print media.

PROFESSIONAL EDUCATION

ACS Professional Education programs bring the latest developments in cancer to the medical community: members and students of the medical, dental, nursing and allied health professions.

National conferences, clinical fellowships, Division- and Unit-level meetings, workshops and scholarships provide information and training in the prevention and early detection of cancer and in the treatment and rehabilitation of cancer patients.

Films, slide sets, audio tapes, speakers, publications and exhibits are available to other organizations for Professional Education programs. The ACS publishes *Ca-A Cancer Journal for Clinicians*, which is directed particularly to the primary physician and has a total circulation of more than 400,000. The Society supports the publication of the journal *Cancer*, directed to those specializing in the care of the cancer patient.

The Society maintains a library of Professional Education motion pictures, available in 16mm and 8mm cartridge formats, as well as in 3/4-inch videocassettes. All are distributed through ACS Divisions

and Units on a free loan or five-year lease basis.

ACS national conferences in 1981 included one on Human Values and Cancer in April, one on Cancer Nursing in October and one on Gastrointestinal Cancer in December. The proceedings of these conferences are published, and highlights are recorded on tape cassettes.

Other meetings included a spring workshop on the Professional Education needs of nurses caring for cancer patients, and a summer working conference on the psychological, social and behavioral aspects of cancer.

The Society initiated in 1981 a program of two-year nursing scholarships. Ten of them were awarded to qualified graduate students studying for a master's degree with a specialty in cancer nursing. Ten additional scholarships are expected to be awarded each year hereafter.

Another new nursing program launched in 1981 is entitled "Clinical Professorships in Oncology Nursing." It provides a means for ACS Divisions to support selected individuals who will develop high-quality cancer teaching programs in the nursing field.

CLINICAL FELLOWSHIPS

The ACS National Clinical Fellowship program since 1948 has spent more than $31 million to train some 6,000 physicians and dentists in the diagnosis and treatment of cancer. Training is provided on two levels at approved teaching centers and hospitals.

The regular Clinical Fellowship program – for hospital residents – is designed to improve the management of the patient with cancer by supporting clinical oncology training for young physicians and dentists.

The Junior Faculty Clinical Fellowship program – for postresident physicians and dentists – is intended to strengthen cancer teaching programs by supporting outstanding young clinicians in academic careers, upon completion of their specialty training.

Fellows put their special skills and knowledge to work through their professional societies, teaching activities in hospital cancer programs and their private practices. Many new departments and divisions of oncology in hospitals and medical schools are now headed by former ACS Fellows. During 1981-1982, training will be supported for approximately 340 Regular Clinical Fellows and 145 Junior Faculty Clinical Fellows.

CLINICAL PROFESSORSHIPS

The ACS supports a program for Professors of Clinical Oncology designed to bring about more effective management of cancer patients by improving cancer teaching in medical schools. Each grant pays up to $25,000 a year for 3-5 years towards the salary of each of the current 16 ACS Professors of Clinical Oncology.

UNPROVEN METHODS OF CANCER MANAGEMENT

The American Cancer Society maintains an extensive reference center for the collection and dissemination of data on unproven methods of cancer management. This information is available on request to physicians, science writers, editors and the general public to assist in evaluating claims made for unproven methods of cancer prevention, detection, diagnosis and treatment.

ACS Divisions are actively involved in encouraging passage of state legislation to curb the use of unproven methods of fighting cancer.

One well-known example of unproven methods is Laetrile, a substance extracted from apricot pits. After exhaustive and repeated tests by many clinical and research institutions, the American Cancer Society, the U.S. Food and Drug Administration and most major medical institutions concluded that Laetrile was not effective in the prevention or treatment of cancer in humans.

In April 1981, the National Cancer Institute completed a series of clinical trials confirming that Laetrile is of no value in the management of human cancer.

Many other unproven methods of cancer management also are being followed closely. Those the Society feels do not conform to established medical, scientific, ethical or legal standards are reviewed regularly for any change in their status.

Occasionally new evidence shows some of these methods to have some benefit against cancer, and the ACS position on them is revised accordingly. The Society always welcomes new developments which have been proven scientifically effective and safe in the prevention, detection, diagnosis or treatment of cancer.

SERVICE AND REHABILITATION

As part of its comprehensive attack on cancer, the American Cancer Society conducts extensive Service and Rehabilitation programs to assist patients and their families. In 1981, more than 400,000 patients were reached through various ACS Service and Rehabilitation programs.

SERVICE

The Units conduct a basic service program which includes: (1) Information and Guidance – a referral service for the cancer patient and family to help them make the best use of all health services and other resources in the community; (2) loans of sick-room supplies and special comfort items – such as hospital beds and wheelchairs – to assist in caring for the homebound patient; (3) gifts and dressings, such as ostomy supplies, wigs, surgical dressings and bedpads; (4) transportation to and from a doctor's office, clinic or hospital for treatment; (5) home health care – provided by ACS volunteers whenever possible, and also through referral to other community services.

Depending on local policies and resources, programs may be expanded to include more extensive services.

REHABILITATION

More than 94,000 patients were assisted in 1981 through ACS rehabilitation programs.

Thousands of individuals who have experienced similar surgery assist patients on a one-to-one basis. With approval of the attending physician, these carefully selected and trained volunteers provide invaluable help – someone for the patient to see and talk to who has successfully coped with the same treatment. Confidentiality is respected in all cases.

Educational materials, including audiovisual aids directed at cancer patients and their families, are available from ACS Units and Divisions.

Laryngectomee Rehabilitation Program – Those who have had their larynxes (voice box) removed because of cancer are faced with the inability to speak, as well as with the trauma of cancer.

Members of the International Association of Laryngectomees (IAL) who have mastered esophageal speech – a technique of forming words with swallowed air – give new patients practical information and psychological support. Both preoperative and postoperative visits are made.

In addition, a host of new surgical methods and the acceptance of electronic or pneumatic devices as a method of communication have brought new hope and flexibility to laryngectomees.

Since the formation of the IAL in 1953, the American Cancer Society has been the sole sponsor of the national IAL office. Today, most affiliated clubs are sponsored to some degree by local Units of the Society.

In 1981, there were 301 affiliated clubs representing 47 states and 16 foreign countries registered with the national IAL.

Mastectomee Rehabilitation Program – Women who have had breast surgery are under psychological as well as physical strain.

Reach to Recovery volunteers, women who have adjusted successfully to the same operation, visit breast cancer patients with their physician's consent, shortly after the mastectomy. They serve as living proof that women after breast surgery can look attractive and return to active, normal lives.

These volunteers also bring practical information on exercises, clothing, swimwear and breast forms that will help make adjustment easier. They do not offer medical advice, but they can provide tips on coping with everyday problems.

A new aspect of the Reach to Recovery program is a service of guidance and emotional support in the matter of breast reconstruction after surgery. Volunteers now are being trained to visit women who want to talk with someone who has experienced breast reconstruction.

Ostomee Rehabilitation Program – Some patients with intestinal or urinary cancers must have abdominal stomas – surgically-constructed openings for the elimination of wastes.

Volunteers who have adjusted successfully to these altered body functions, as well as allied health professionals known as enterostomal therapists (ET's), are working closely with new patients to help them lead productive lives free of complications and embarrassment. The Society encourages its Divisions to train new ET's to meet patient needs, and also assists ET schools financially.

ACS Divisions work closely with chapters of the

United Ostomy Association in visiting ostomy patients and giving them emotional support.

CanSurmount – A one-to-one visitation program for persons experiencing all other types of cancers; now being established throughout the United States. Based on the same principles as the other visitation programs, CanSurmount volunteers offer peer support and understanding to patients desiring this service.

I Can Cope – Having a diagnosis of cancer often leaves the patient and family feeling frightened, lonely and confused. They are suddenly thrust into a world of unknowns and uncertainties, and often must struggle with such day-to-day problems as physical limitations, financial worries and family concerns. Many are able to cope effectively with the ongoing process, but most can greatly benefit from additional information.

I Can Cope is a patient/family education program designed to offer information about cancer and its treatments; about coping with the physical and emotional effects of the disease. Class sessions cover such topics as understanding the disease of cancer, learning proper nutrition and exercise, and learning how to handle problems related to stress and self-image. In addition, participants are given information about ACS and other community resources.

Classes are taught by physicians, nurses, social workers and other community professionals.

Candlelighters – A peer support organization for parents of children and adolescents who have or have had cancer. While Candlelighters groups are not a part of the American Cancer Society, Divisions and Units are encouraged to work with the local Candlelighters chapters to meet the needs of children with cancer in their communities.

Besides the above groups, a number of Divisions and Units have developed other peer and professional support groups based on local needs and the leadership resources available.

RESEARCH

The American Cancer Society is one of the largest sources of cancer research funds in the United States, second only to the National Cancer Institute, the agency of the Federal government.

The Society's overall investment in research each year has grown steadily from $1 million in 1946 to more than $51 million* today. This sum represents nearly a third of the total ACS budget. To date, the Society has invested more than half a billion dollars in cancer research.

The focus of the program is on individually developed projects, rather than directed research on a contract basis. With the exception of epidemiological work, the ACS neither hires staff researchers nor operates its own laboratories. This gives the Society the freedom to place its grants wherever the most innovative and promising work is being done.

A key factor in the role of the Society in cancer research is the value of providing qualified scientists with alternative sources for research funds. The Society believes it can make most effective use of its research funds by supporting scientists working in established medical institutions across the country. In this way there is a minimum of overhead and a maximum of flexibility to make sure that research money yields results. Applications for ACS grants are carefully evaluated by scientific review committees and by the Board of Directors.

KINDS OF GRANTS

The Society makes five types of grants to support research: (1) Research and Clinical Investigation Grants to finance investigator-initiated research; (2) Institutional Research Grants to universities, institutes and hospitals to support pilot studies and the work of young investigators in the cancer field; (3) Research Personnel Grants to outstanding scientists and students specializing or planning to specialize in cancer research; (4) Research Development Program Grants to provide rapid funding for priority projects; and (5) Special Institutional Grants for Cancer Cause and Prevention Research to provide longer-term funding.

Research Professorships – The Research Professorship grant program, unique in the field, has been in existence since 1957. The Society invests about $700,000 in it each year to support 22 of the nation's most gifted scientists. These are people devoting their lives' work to cancer research. Freed of major administrative responsibilities and other restrictions, they can concentrate on their chosen fields of scientific investigation.

Research Development Program – This was established to identify and provide rapid funding for high priority projects. Approved applications can be funded in less than three months from the date submitted. This compares with the 10 to 18 months required by the Federal government before a new

*Subject to audit; does not include $2 million in committee and operating expenses for evaluating and processing research applications.

approved application can be funded. More than $10 million has been appropriated so far, over half of which has been for interferon research.

The kinds of research projects eligible under the Research Development Program include: (1) unique research opportunities which cannot wait for the normal lengthy funding procedures; (2) unanticipated needs relating to research already under way; (3) program coordination, especially that involving clinical trials and the dissemination of research results to community hospitals; and (4) program integration between the American Cancer Society and other health organizations.

All applications are evaluated for – among other considerations – merit, qualifications and productivity of the investigator, relevance, need for rapid funding, and probability of the project's eventual contribution to cancer control.

Interferon Research – Interferon, a natural body protein with low toxicity, was discovered in 1957 as an antiviral agent and later was found to have some anticancer activity. In 1978, the Society invested an unprecedented $2 million to purchase interferon for clinical trials. The substance has always been extremely scarce and expensive, since it is obtained from human blood cells.

The first tests are being performed on carefully selected patients in 10 institutions, and will include 150 patients in all. Four cancers are involved – multiple myeloma, melanoma, breast cancer and non-Hodgkin's lymphoma.

A number of patients so far have shown some response to the interferon, ranging from those whose steady downhill course was stabilized, to those whose tumors disappeared entirely. It is still too early to tell what the long-term effect will be on the patients' survival and well-being.

Although the results to date have not exceeded those of other proven cancer treatments, researchers are encouraged, especially since the interferon used to date has been only 1/1000% pure.

Considerable progress has been made recently toward producing interferon synthetically in large quantities, at much lower cost, and in a much purer form than ever before. These promising developments have prompted the Society to allocate an additional $4.8 million for interferon research.

Ultimately, interferon may be valued not so much for itself, but for its role in heralding a whole new class of compounds called "biologic response modifiers," which will fight cancer through stimulation of the body's immune system.

The 10 institutions conducting interferon research are:

University of Texas M.D. Anderson Hospital and Tumor Institute, Houston, Texas – Dr. Jordan Gutterman.

Memorial Sloan-Kettering Cancer Center, New York, New York – Dr. Herbert Oettgen.

Stanford University Medical Center, Palo Alto, California – Dr. Thomas C. Merigan, Jr.

Roswell Park Memorial Institute, Buffalo, New York – Dr. Thomas L. Dao.

Johns Hopkins Medical Center, Baltimore, Maryland – Dr. Albert H. Owens, Jr.

College of Physicians and Surgeons, Columbia University, New York, New York – Dr. Elliott Osserman.

University of California, Los Angeles, California– Dr. Donald L. Morton.

Yale University Medical Center, New Haven, Connecticut – Dr. Joseph Bertino.

University of Wisconsin Hospital, Madison, Wisconsin – Dr. Ernest C. Borden.

Mount Sinai Medical Center, New York, New York – Dr. James F. Holland.

Besides the American Cancer Society, sponsors of interferon research include such bodies as the National Cancer Institute and the National Institute of Allergy and Infectious Diseases.

THE FINANCIAL RESEARCH PICTURE

In fiscal 1981, the ACS made 672 grants to major institutions in this country and to scientists working both here and abroad. The total amount, subject to audit, was nearly $50 million. This does not include some $2.5 million granted directly by ACS Divisions.

The following table – covering the years 1975 to 1981 inclusive – lists the number and total dollar amount of applications received, and those funded by the ACS National Office. The ACS allocates its funds based on a three-pronged attack against cancer involving Research, Education and Service.

	REQUESTED		FUNDED	
Year	Number	Amount	Number	Amount†
1975	1,456	106,069,802	475	22,320,799
1976	1,572	117,059,144	542	26,903,873
1977	1,696	113,887,083	630	34,263,941
1978	1,912	162,535,560	641	33,193,448
1979	1,940	171,999,099	715	42,875,610
1980	1,931	188,032,301	721	45,615,789
1981	2,069	230,936,242	672	51,960,530*

ACS-SUPPORTED NOBELISTS

Three scientists who have received ACS research support were Nobel Prize winners for 1980.

Dr. Paul Berg, a biochemist at Stanford University, received his first ACS grant in 1969. The studies of Dr. Berg and *Dr. Walter Gilbert* into recombinant DNA technology have helped to induce bacteria to produce interferon.

Dr. Gilbert, professor of molecular biology at Harvard University and a long-term ACS Research Professor, shared the Nobel Prize with Dr. Berg. Dr. Gilbert was the first to produce a human hormone from a virus combined with genes from a bacterial chromosome.

Dr. Baruj Benacerraf was awarded the Nobel Prize for Medicine because of his work in immunology. He received an ACS grant in 1972.

Dr. Daniel Nathans and *Dr. Hamilton O. Smith*, Johns Hopkins microbiologists who have received ACS grants over the years, shared the 1978 Nobel Prize in Medicine with Swiss scientist *Dr. Werner Arber*. Nathans and Smith made possible the decoding of a cancer-causing virus, SV40, yielding the largest genetic message yet decoded. It may shed more light on how the cancer process starts and stops. Arber discovered a class of enzymes called endonucleases, Smith later found a specific kind of endonuclease, and Nathans applied endonuclease to genetic decoding.

Two ACS Research Professors, *Dr. David Baltimore* and *Dr. Howard M. Temin*, shared the 1975 Nobel Prize for Medicine with *Dr. Renato Dulbecco* for their work in viruses and genetics. Among other things, it led to the discovery that DNA is not always the "master molecule" and may be produced by RNA.

Temin's recent work has revealed the origin of at least one class of viruses and how they might interact with a cell's hereditary factors to produce cancer.

Dr. Robert W. Holley (ACS Research Professor) received the Nobel Prize in 1968 along with two other Americans for discovering the process by which enzymes determine a cell's function in genetic development.

Dr. Charles Huggins ('66) was the first to demonstrate the importance of hormones in the development and treatment of cancer of the prostate and breast. *Dr. Peyton Rous* ('66) demonstrated that viruses are a cause of cancer in animals. *Dr. James Watson* ('62), with his colleagues, discovered the "architecture" of DNA. *Dr. Severo Ochoa* ('59) and his associates disclosed how the DNA molecule is synthesized. *Drs. George W. Beadle* and *Edward Tatum* ('58) uncovered the mechanism by which genes transmit hereditary traits and functions.

CANCER AND THE ENVIRONMENT

Most cancer cases in the United States are believed to be environmentally related, that is, associated in some way with our physical surroundings, personal habits or lifestyles.

Occupational hazards, although associated with only a small percentage of cancers, are under close surveillance. Virtually every suspected major chemical hazard discussed by the news media is under investigation. Each study, however, can require years and hundreds of thousands of dollars to complete, since many cancers take decades to develop.

Some environmental causes of cancer are well-known. About 20% of all cancers are directly related to the use of tobacco, either alone or in conjunction with excessive consumption of alcohol.

Other causes are more difficult to pin down. One suspected influence is diet, which some experts have associated with major cancer sites. So far, however, the evidence has been indirect and inconclusive.

To help identify environmental factors in human

†For the years 1975-81 ACS chartered Divisions spent an additional average of $2,500,000 per year for research.
*Subject to audit.

cancer, the American Cancer Society in 1971 embarked on an extensive Environmental Cancer Research Project, involving: (1) a resumption of the Society's Cancer Prevention Study, and (2) studies of groups exposed to industrial substances suspected of causing cancer.

CANCER PREVENTION STUDY

The Society realized more than two decades ago the potential for saving lives from cancer through prevention. From this concept, the ACS Cancer Prevention Study developed, the largest human biological study of life and death ever undertaken. Some 68,000 volunteers were mobilized to enroll more than a million Americans in the study.

More than 450 million pieces of computerized information were collected. This data provided overwhelming evidence that cigarette smoking is the major cause of lung cancer and an important factor in other cancers. It also yielded vital information about heart disease and other serious illnesses.

The Cancer Prevention Study was a six-year undertaking begun in 1959; in 1971 it was resumed.

One result of the study's resumption was an analysis showing that obesity is clearly linked to rising mortality rates from heart disease, cancer and other diseases.

For individuals who are 40% or more overweight, cancer mortality is 33% above normal for men, and 55% for women. Among the cancers most involved were colorectal (men), and breast, uterus and ovary (women).

The Cancer Prevention Study continues today in the examination of long-lived survivors of the original million persons enrolled. Learning why some people do not get cancer can be as important as learning why others do. The influence of heredity, lifestyle and other factors is considered.

Since the start of the Cancer Prevention Study, many new factors in the environment which may cause cancer have been identified. The Society therefore is planning to launch a new prospective study – Cancer Prevention Study II – in the fall of 1982. Some 80,000 volunteers and more than one million subjects will be involved.

The Society is now charting a new dimension in cancer prevention by initiating a series of Special Institutional Grants for Cancer Cause and Prevention Research. They will be unique in that they provide substantial, flexible and long-term support to institutions studying various environmental cancer links.

Special Institutional Grants so far have been awarded to:

- The Environmental Sciences Laboratory at Mount Sinai School of Medicine, New York City, for an environmental cancer information unit under the direction of Dr. Irving J. Selikoff.
- The Johns Hopkins University School of Medicine, Baltimore, Md., for a program focusing on the hazards of medical drugs. Drs. Ernest Bueding and Paul Talalay direct the study.
- The University of Southern California School of Medicine, Los Angeles, to study the possible relationship of cancer to various environmental exposures. Drs. Brian E. Henderson and Charles Heidelberger head the program.
- The UCLA Jonsson Comprehensive Cancer Center, Los Angeles, for a behavioral smoking research program directed by Dr. Murray Jarvik.

STUDIES OF OCCUPATIONAL GROUPS

With the cooperation of industry and labor unions, a number of studies of union workers exposed to various agents have been undertaken. It has been found that asbestos workers have a high risk of lung cancer, gastrointestinal cancer and other conditions.

One important asbestos study concerns possible health hazards to persons living near an asbestos plant more than 35 years ago. They were exposed to dust from chimneys and open windows of the plant. Their death rates, from cancer and all causes, were no higher than those of another group living in the same city, but not exposed to asbestos. We are now studying the mortality of family members of asbestos workers to determine if they have an extra risk of lung cancer and other asbestos-related diseases.

A study of roofers exposed to benzo (a)-pyrene showed that after 20 years of exposure, this kind of worker had elevated death rates from cancer of the lung and several other sites.

A study of anesthesiologists showed no increase in mortality rates, and cotton textile workers had no elevated incidence of lung cancer, despite other respiratory problems. Occupational groups under continuing investigation include vinyl chloride workers, painters, rubber plant employees, those who work with polychlorinated biphenyls (PCB's), and shipyard workers.

COSTS OF CANCER

Because of a lack of data in many areas, the real costs of cancer are very difficult to judge. Based on recent studies, direct cancer costs in the United States have been estimated at $9.1 billion for the year 1977. Included in this figure are hospital and outpatient expenses, physicians' fees, nursing services, home care and drugs.

Indirect economic costs, including lost wages and the forced liquidation of tangible assets, have been estimated at between $13.7 and $17.1 billion for the year 1975.

The Third National Cancer Survey indicates that some $3.5 billion was spent in 1976 on hospital costs alone for patients with cancer. The (former) Department of Health, Education and Welfare calculated that hospital expenses make up a greater proportion of the total direct costs of cancer than they do for diseases in general. Physicians' fees are somewhat less than average.

Individual costs vary considerably, depending on the location of the cancer, possible recurrences and the extent of follow-up care. Daily hospital fees alone can run $200 or more a day, and each course of therapy can amount to several thousand dollars. A few years ago, *Consumer Reports* estimated the average cancer patient's medical bill at $20,000. This figure can be matched by the indirect costs of cancer, which range from transportation to home nursing to loss of income.

Individuals have several sources of help in paying for cancer costs: third-party payers such as Blue Cross and private insurance companies, public agencies and private health organizations. Cancer is covered by personal insured plans either under narrowly defined cancer policies, or through catastrophic illness provisions in comprehensive insurance programs.

The Third National Cancer Survey shows that for patients under 65 years, Blue Cross and private insurers were the source of payment in over 77% of the cases. For patients over 65, Medicare paid expenses in nearly 88% of the cases.

Hospital costs can be reduced substantially through the use of nursing facilities, hospices for advanced cancer patients, and home care with periodic professional medical visits. Various studies have estimated home care to average $10-15 a day.

Four major cancers accounting for about half of the cancer cases in this country – breast, lung, colon and uterine cervix – are costing private industry $1.6 billion a year, with the largest items $850 million in medical care and $500 million in company- funded life insurance benefits.

SOURCES OF INCOME

Financial support of the American Cancer Society in fiscal 1981 is estimated to exceed $170 million from public sources. The Cancer Crusade raised about $124 million. National Headquarters and chartered Divisions received some $46 million from bequests and legacies. The Public has given generous and growing support to the Crusade over the years. In 1944, for example, the Society raised $800,000. Thirty-five years later, in 1979, that figure had soared to more than $142 million.

Legacies–in which the Society becomes beneficiary of willed funds–are an increasingly important source of ACS income. Income from legacies indicates confidence in the leadership of the Society and a determination by many Americans to continue the fight against cancer even after their lifetimes. Legacy income in relation to Crusade receipts is shown below.

Year	Crusade	Legacies	Year	Crusade	Legacies
1971	56,427,471	13,636,651	1976	84,882,450	33,968,066
1972	62,044,243	16,774,295	1977	90,120,508	24,605,566
1973	67,784,862	25,228,782	1978	95,927,848	30,178,722
1974	72,152,315	24,116,620	1979	102,778,011	39,360,721
1975	78,788,160	31,056,259	1980	113,325,055	41,366,087

CANCER-RELATED CHECKUPS

The new ACS guidelines for the early detection of cancer in people without symptoms recommend a cancer-related checkup every 3 years for everyone between the ages of 20-40. The Society advises: Talk with your doctor – ask how the guidelines relate to you. The checkup should always include health counseling (such as tips on quitting cigarettes) and examinations for cancer of the thyroid, testes, prostate, mouth, ovaries, skin and lymph nodes. And in particular: for *breast cancer*, an exam by a doctor every 3 years, self-exam every month, one baseline breast X ray between ages 35-40; for *uterine cancer*, a pelvic exam every 3 years; for *cervical cancer*, a Pap test at least every 3 years – after 2 initial negative tests 1 year apart (this should include women under 20 if sexually active).

A cancer-related checkup as described above is recommended every year for men and women age 40 and over. For early detection of *breast cancer*, an exam by the doctor every year, self-exam every month and breast X ray every year after 50 (between ages 40-50, ask your doctor); for *uterine cancer*, a pelvic exam every year, and for *cervical cancer*, a Pap test at least every 3 years; for *endometrial cancer* an endometrial tissue sample at menopause if at risk. For *colon and rectum cancer*, a digital rectal exam every year after 40; after 50, a stool occult blood test every year and a procto exam every 3 to 5 years – after 2 initial negative tests 1 year apart.

Some people are at higher risk for certain cancers and may need to have these tests more frequently. See individual sites for higher risk factors.

THE AMERICAN CANCER SOCIETY

The American Cancer Society, Inc., is a national voluntary health organization of 2½ million Americans united to conquer cancer through balanced programs of research, education and patient service and rehabilitation. Its symbol is the Sword of Hope – a double-edged blade with twin serpent caduceus to emphasize the medical and scientific aspects of the Society's programs; it appears on all ACS materials and is displayed at meetings, lectures, exhibits and film showings.

Organization: The American Cancer Society, Inc., is composed of a National Society, with 58 chartered Divisions and 3,128 local Units.

The National Society: A 196-member House of Delegates provides a basic representation from the 58 Divisions and additional representation on the basis of population. It elects and is governed by a Board of Directors of 117 voting members, approximately half of whom are members of the medical or scientific professions. The National Society is responsible for overall planning and coordination, and provides technical help and materials to Divisions and Units. The National Society administers programs of research, medical grants and clinical fellowships, and is charged with carrying out public and professional education on the national level.

The 58 Divisions: These are governed by 3,847 members of Divisional Boards of Directors, both medical and lay, in all the states plus six metropolitan areas, the District of Columbia and Puerto Rico.

The Units: These are organized to cover the 3,130 counties in the U.S. There are more than 77,000 community leaders who direct the Society's programs at this level. The basic strength of the Society lies in the loyal ranks of volunteers fighting cancer in their communities.

The Programs: The ACS maintains its priorities and goals through activities developed by the departments of Research, Professional Education, Public Education, Public Information, Epidemiology and Statistics, Service and Rehabilitation, and Crusade.

CELEBRITIES AND CANCER

Cancer has struck many famous persons. Bess Myerson and Van Johnson have had cancer; others are: Betty Ford, Happy Rockefeller, and Shirley Temple Black; television's Virginia Graham, Betty Rollin, Arthur Godfrey and Amanda Blake; pro football's Jack Pardee and golf's Gene Littler.

The toll with each passing year is a reminder of cancer's human devastation. Some who have not survived include:

Entertainment
Tallulah Bankhead
Jack Benny
Humphrey Bogart
Gary Cooper
Duke Ellington
Susan Hayward
Frederic March
Ozzie Nelson
Minnie Riperton
Rosalind Russell
Vivian Vance
John Wayne

Science
Tom Dooley
Margaret Mead

Literature
Rachel Carson
T.S. Eliot
Edna Ferber
Erle Stanley Gardner
Lorraine Hansberry
Cornelius Ryan
Jacqueline Susann

Communications
Stewart Alsop
Chet Huntley
Frank McGee
Walter Winchell

Sports
Walter Hagen
Fred Hutchinson
Vincent Lombardi
Babe Ruth
Casey Stengel
Babe Didrikson Zaharias

Politics
Marvella Bayh
Chou En-Lai
Sen. Hubert H. Humphrey
Golda Meir

Died of Lung Cancer
Nat "King" Cole
Walt Disney
Betty Grable
Buster Keaton
Edward R. Murrow
Jesse Owens
Robert Ryan
William Talman

How to Estimate Cancer Statistics Locally

Community Population	Estimated No. Who are Alive, Cured of Cancer	Estimated No. Cancer Cases Under Medical Care in 1982	Estimated No. Who Will Die of Cancer in 1982	Estimated No. of New Cases in 1982	Estimated No. Who Will be Saved from Cancer in 1982	Estimated No. Who Will Eventually Develop Cancer	Estimated No. Who Will Die of Cancer if Present Rates Continue
1,000	9	4	1	3	1	250	164
2,000	18	11	4	7	2	500	328
3,000	27	15	5	10	3	750	492
4,000	36	20	7	13	4	1,000	656
5,000	45	25	9	16	5	1,250	820
10,000	90	51	18	33	11	2,500	1,640
25,000	225	124	45	79	26	6,250	4,100
50,000	450	248	90	158	53	12,500	8,200
100,000	900	505	180	325	108	25,000	16,400
200,000	1,800	1,010	360	650	217	50,000	32,800
500,000	4,500	2,475	900	1,575	525	125,000	82,000

NOTE: The figures can only be the roughest approximation of actual data for your community. It is suggested that every effort be made to obtain actual data from a Registry source.